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ABSTRACT

This document presents curriculum ideas and procedures developed by the Child Development Research Group at the University of Washington for a model preschool program designed for intellectually advanced children 2 to 5 years old. The program was designed to offer teacher- and child-structured learning situations that provided instruction in language arts, science, mathematics, social studies, art, music and drama. Activities that develop physical and social skills were also part of the program. Chapters cover the identification and screening process; the planning of a program for intellectually advanced children; planning for the learning of social and physical skills; and the curriculum goals, sample lesson plans, and references for the mathematics, science, language arts, social studies, and art curricula. Appendices include reports on creative dramatics and mathematics programs for intellectually advanced children; sample parent questionnaires; and sample final student evaluation forms. (SB)

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PROGRAMMING FOR INTELLECTUALLY ADVANCED PRESCHOOL CHILDREN:

A Program Development Guide

by

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PRELIMINARY DRAFT

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The identification system was the product of the joint efforts of many people. Dr. Nancy Jackson, Research Coordinator for the longitudinal study, took a leading role in developing and testing the system. The authors also wish to thank Dr. Jackson for her considerable contributions to the establishment of the rationale which has been implemented in the project's programs for intellectually advanced children. Thanks are also due to Stephen McClelland, David Shorr, Richard Krinsky, Suzanne Krinsky, and Janet Miller for their work in developing the screening system and in designing and carrying out the program of testing and research.

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Chapter 1

Overview of the Seattle Project

The curriculum ideas and procedures suggested here were developed in the context of a comprehensive program of research and service which focuses on the development of children with advanced intellectual abilities. The development of the Curriculum Guide was supported by a grant from the U.S. Office of Education (USOE) and was done by the Child Development Research Group at the University of Washington. Associated activities of the Research Group include a longitudinal study of children with advanced intellectual skills, an educational counseling and diagnostic service for families of intellectually advanced children, and a model preschool program for gifted children. The Research Group is also involved in discussions with public school officials concerning the design of public school programs for superior students, and is launching a program of early entrance to the University of Washington for academically superior junior high school students.

During the 1976-77 academic year, 30 children between the ages of 2 and 5 years were enrolled in the Child Development Model Preschool. Teaching staff for the school included two head teachers and six part-time assistant teachers, under the supervision of Dr. Wendy C. Roedell, Education Coordinator and Research Assistant Professor. Research and testing services were supplied by five Developmental Psychology graduate students under the supervision of Dr. Nancy E. Jackson, Research Coordinator and Research Assistant Professor. Ms. Elisabeth Bell served as community liaison. Dr. Halbert B. Robinson, Professor of Psychology and Chairperson of the Child Development Research Group, is the Project Director.

The preschool program has been designed to offer a variety of learning experiences in a balanced mixture of teacher- and child-structured situations. Teachers work together as a team to provide individualized instruction in language arts, science, mathematics, and

social studies. Art, music, and drama are integral parts of the curriculum. Physical skills are developed through planned activities involving large and small muscles. Considerable emphasis is placed on helping children acquire the social sensitivity and interpersonal skills which will allow them to participate comfortably in different social situations.

Morning preschool is in session daily from 8:45 to 11:15 a.m. About half of the children bring their lunches and remain for the afternoon session, which lasts until 2:15 p.m. A kindergarten program has been added for the 1977-78 school year, and some children attend the afternoon program only. Children are combined in multi-age groupings throughout the day, and grouped by competence level for teacher-structured lessons. The basic outline of the program is provided by the following flexible daily schedule:

Daily Schedule

This schedule is to be regarded as the basis for a planned day. It is flexible, and subject to change due to field trips, weather conditions, special projects, or other good reasons.

8:45 - 9:00	Arrival: Children are greeted individually by a teacher. A brief health check insures that each child will be comfortable at school.
8:45 - 9:30	Outdoor time: Children participate in outdoor activities of their choice.
9:30 - 9:45	Transition: Children come inside, and hang coats in their lockers. They check their lockers for the tag which tells them which room to go to. Children go to appropriate area, use the bathroom if necessary, and get ready for group time.
9:45 - 10:30	Group time: Children are divided into small groups of 6 or 7 for teacher-structured activities in one of the curriculum areas--Art, Social Studies, Math, Language Arts, Creative Dramatics and Science. Group time includes stories, conversation, and a snack along with a planned lesson.

10:30 - 11:00	Activity time: Children participate in indoor activities of their choice. Frequently, children's activities are extensions of the group time experience. A variety of learning materials are available, including blocks, dress-ups, art materials, letter and number boards, story tapes, pattern blocks, etc.
11:00 - 11:15	Clean up: As children clean up their free time activities, they can choose to join groups for singing or engage in quiet activities until parents arrive to pick them up.
11:15	Departure: Parents arrive to pick up morning children. Outdoor time: School day children participate in outdoor activities of their choice.
11:45 - 12:20	Lunch: School day children have lunch. As they finish, they clear their places and go outside.
12:20 - 12:30	Transition: Children come inside, hang their coats, and prepare for group activities.
12:30 - 1:30	Group time: Children are divided into small groups of 6 or 7 for teacher-structured activities.
1:30 - 2:00	Activity time: Children participate in indoor activities of their choice. Available activities integrate curriculum content areas and may take the form of an ongoing project.
2:00 - 2:15	Clean up and snack.
2:15 - 2:30	Departure: Parents arrive to pick up their children.

Chapter 2

Identification and Screening

The screening system devised by the Child Development Research Group is designed to document instances of a child's best performance in some area of intellectual ability. Some children qualify for the program by demonstrating generally advanced intellectual abilities. Others qualify on the basis of unusually advanced abilities in specific areas, such as reading, memory, or spatial reasoning. Evaluation of applicants is based on a comprehensive profile of each child's interests and abilities as reflected in information drawn from parents and from scores on a battery of standardized tests. The information is compiled on a screening point system, in which children are awarded points for advanced ability indicated in parent report or test performance. Points are also awarded for possible biasing factors such as bilingualism or cultural difference.

There are several considerations in designing a system for identifying preschool children with advanced intellectual abilities. It is particularly difficult to assess the capabilities of a very young child in any single standardized testing situation. If a child does exceptionally well on the tasks presented, one can be confident of the child's ability. If a child does not score well on a particular test, however, lack of ability is only one of several possible determinants. A test score may be depressed, for example, by the child's nervousness at being closeted in a strange room with an unfamiliar adult. Young children are sometimes more interested in playing their own games with the test materials than in solving the particular problem presented by the test. It is unrealistic to demand consistently high performance across a broad range of tests. At best, available measuring instruments provide a crude index of any individual's capabilities. The imprecision in testing is magnified when the individual is a young child.

If formal testing time must be limited to a single session, a broad range of test items should be included to maximize the probability that a particular type of item will inspire the child to advanced achievement. Instruments chosen for testing should include enough difficult items to allow for sufficient differentiation in performance among children at the upper end of the scale. Bright children will not be differentiated from average children unless they are presented with sufficiently challenging material. When using a range of test items, it is important to look at each type of measure independently, rather than averaging all scores together. A three-year-old child who performs like a seven-year-old on tests of spatial ability but whose vocabulary scores are average is a very different child from one who performs at a slightly above average rate on both types of tasks. In the first case extraordinarily advanced ability has been demonstrated, but may not be detected if the different types of test scores are averaged during the screening process.

The test battery currently in use at the Child Development Preschool includes the short form (starred items only) of the Stanford Binet Intelligence Scale (Terman & Merrill, 1972 Norms Edition), the forward and backward digit sequence from the McCarthy Scales of Children's Abilities (McCarthy, 1972), Arithmetic, Mazes, and Block Design subtests from the Wechsler Preschool and Primary Scales of Intelligence (Wechsler, 1967) and from the Wechsler Intelligence Scale for Children--Revised (Wechsler, 1974), and a non-standardized reading test. This package provides an estimate of general intelligence, an additional opportunity to observe possible advanced memory ability, a separate measure of spatial reasoning ability, and tests of specific academic skills. The battery takes approximately one hour to administer. Most young children are not able to remain involved in a testing situation for much longer than that. Young children who demonstrate advanced reading or whose parents report precocious reading skill are tested during a second session with the Peabody Individual Achievement Test (Dunn & Markwardt, 1970). Preschool applicants can accumulate screening test points by demonstrating superior performance on any of these measures.

Even this broad range of test items may provide a limited sample of a child's behavior which may or may not include some indication of the child's most advanced abilities. Parents, on the other hand, have an opportunity to observe their child's behavior under a wide variety of conditions. Intellectually advanced children do things which are notable, and parents can provide sensitive, accurate descriptions of their children's behavior. Parent report is most reliable when parents are asked to describe their child's actual performance rather than to rate their child's ability on an arbitrary scale. In general, parents have not had the opportunity to interact with a broad range of children. They have not had the experience to arrive at a standard conception of what is normal and what is advanced development. A parent may be able to provide a detailed description of a child's accomplishment, and still have no way of judging to what extent the behavior may be advanced.

The parents of each applicant to the Child Development Preschool are required to complete an extensive questionnaire (see attached sample copy). Questionnaires are rated by two independent trained judges. Ratings are given in such areas as Language Ability, Spatial Ability, Reading, and Mathematics. A child might earn a score of from 0 to 2 points in each area. No points are given for a rating of "average" ability, one point is given for a rating of "superior" ability, and two points are given for a rating of "extraordinary" ability. Ratings from the two judges are averaged to provide a single point score for each area.

Preliminary evidence from the longitudinal study indicates that parent report information tends to correspond fairly closely to the child's overall test performance. The correlation between points from parent report and total test points for the 75 children screened for the 1977-78 preschool session was .69 ($n = 48$).[1] More important, however, is the indication that when a child's reported abilities are not

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[1] Spearman rho, $p < .001$

documented during a test session, the parent report may, in the long run, prove to be the better estimate of the child's true abilities. Several children in our study whose test scores were only slightly above average at age 2 but whose parents reported advanced accomplishments demonstrated extraordinarily advanced test performance at age 4 or 5.

Final evaluation of preschool applicants takes place in several ways. Three lists are established, with a cutoff point score on each. One list summarizes each child's test point scores; the second list summarizes children's parent report point scores; the third list combines parent points with test points and adds compensatory points for possibly biasing factors such as bilingualism and cultural differences. A child is considered qualified for the preschool program if the child's score on any of the three lists rises above the cutoff. Final decisions on enrollment reflect the school's need to preserve a balance of ages and sexes in the program, to serve children from diverse ethnic backgrounds, and to enroll a group of children whose superior intellectual talents lie in a variety of domains.

Chapter 3

Planning a Program for Intellectually Advanced Children

Diversity and Uneven Development

Any program for intellectually advanced children must take into account their extreme diversity at all levels. In the first place, children's intellectual skills may not be equally advanced in all areas. The best reader may not be the best mathematician. Children with equivalent IQ scores may differ widely in their academic skills. Some children, for example, handle conceptual problems as well as third or fourth graders, but are just beginning to learn reading skills, while others may be reading fluently. When we administered the Peabody Individual Achievement Test to our preschoolers, performance ranged from the preschool level to the fourth grade level on individual subtests. We administered the same test to a comparison preschool group and found a much more restricted range--from preschool to first grade level.

Children's physical development may be proceeding at an average pace, outstripped by their rapidly advancing cognitive skills. For example, a child may be able to read at the fourth grade level but have difficulty manipulating a pencil. While some intellectually advanced children may be physically advanced as well, others may display physical awkwardness and lack of coordination.

In many cases, children's intellectual capacities have progressed far beyond their level of social maturity, creating what might be called an "intellectual-social gap." People often become angry at children when their social skills fall short of the expectations generated by their general intellectual maturity. Some intellectually advanced children may demonstrate comparably advanced social sensitivity. We have seen many three and four year olds, however, with mental ages of six and seven, who still need help with toileting and dressing, who hit and kick other children when frustrated, who have trouble communicating needs and feelings to other children, who lack the skill to initiate play or to

join a group, who have not learned to share and take turns, and so on. This uneveness in skill level may be particularly difficult for young children who must cope either with being more advanced in intellectual ability than many of their same-age peers, or with being the youngest in a group of older children who are their intellectual peers. Such children need a large repertoire of social skills, a strong self-image, and a realistic appraisal of what their particular intellectual advancement means and does not mean.

The most important characteristic of any program for intellectually advanced children is individual planning related to the particular strengths and weaknesses evident in each child's pattern of abilities. The educator's task is not, as with compensatory programs, to bring children up to a minimum level of performance. Rather, the task is to provide a match of learning experience with competence level in each subject area, and to facilitate the child's progress at his/her own rate.

General Goals

In the Child Development Preschool, the approach has been to provide a range of learning experiences designed to encourage the development of the following:

--thinking skills, such as observing, predicting, classifying, analyzing, synthesizing, and evaluating

--intellectual curiosity and persistence in developing creative approaches to problem-solving

--creative expression in a wide range of areas, including art materials, dramatics, movement and dance, and language

--strong foundations in traditional academic skills, with advanced work tailored to individual competencies

--social perceptiveness, awareness of the needs of others, and social problem-solving skills

--large and small muscle coordination and dexterity

Basic Premises

The program is based on an eclectic set of principles derived from theories and research in psychology and education. The illustrative premises listed below represent a synthesis of our theoretical and empirical conclusions about the nature of young children and their learning. Sources for these premises include the work of Piaget (e.g., 1971), Bruner (e.g., Bruner, Olver & Greenfield, 1966), Weikart (e.g., Weikart, McClelland, Smith, Kluge, Hudson, & Taylor, 1970), Baer (e.g., Risley & Baer, 1973), Bandura (e.g., 1969), and others. A more extensive discussion of these and other principles, their origins, and a complete set of references can be found in Cognitive development in young children (Jackson, Robinson, & Dale, 1977) and Social development in young children (Roedell, Slaby, & Robinson, 1977).

To the best of our present knowledge, the premises governing the model preschool program apply equally well to the learning and development of both intellectually advanced children and children of average intellectual competence. For unusually advanced children, however, chronological age is inadequate even as a rough estimate of abilities or interests. Individual children vary greatly in the maturity of their understanding in particular areas, the speed with which they can learn new concepts and skills, and their ability to organize information and generalize from one experience to another. Thus, while general principles of learning and development apply to all children, individual differences in children's abilities have a dramatic impact on the specific content of a preschool program. The basic premises which underly our preschool program, together with some specific implications of each one, are presented below.

1. Children have a natural desire to learn, which is maximized when new experiences are optimally matched with the individual child's previous experiences and existing level of understanding. Attention, memory, and comprehension are enhanced when each new experience builds upon and expands previous experiences.

   Implications:

   a. Through extensive observation, teachers become aware of each child's existing level of competence or understanding in

cognitive, social and motor skills so that learning experiences can be planned appropriately.

b. Group learning experiences are designed so that individual children can absorb the experience on different levels.

c. Children are permitted considerable freedom in choosing activities. Activities which fail to engage a child's interest are reevaluated. At times, children may need direction and encouragement to develop mastery of basic skills sufficient to enjoy an activity for its own merits.

d. Learning experiences are planned in coherent, related sequences spanning hours, days, and weeks. However, teachers are also ready to elaborate on the children's enthusiasms as they occur.

2. Although young children can and do learn by quietly watching and listening, many ideas and skills are best learned when children have opportunities for active involvement--for touching, talking, and testing things on their own. Active involvement in learning may take place on an abstract or verbal level, as when children are given opportunities to predict what might happen in a given situation, or to synthesize or evaluate what a teacher has said. Nonetheless, concrete materials provide an excellent opportunity for involving children in the learning process.

   Implications:

   a. The preschool environment includes a diverse array of materials which children can use for exploring on their own and with the teacher's guidance.

   b. Teacher demonstration and explanations are accompanied by opportunities for children to manipulate both materials and ideas.

   c. As children progress in their exploration of materials, teachers add new materials and change the physical environment to accommodate the children's developing sophistication.

3. A child's tendency to perform particular behaviors is affected by the intrinsic interest of different activities, the extrinsic consequences produced by behavior, and the behavioral models provided by teachers and other children. In general, children will tend to repeat behaviors which are followed by attention from people they know and like.

   Implications:

   a. Teachers focus their attention on the positive, constructive behaviors demonstrated by each child, and ignore less desirable, destructive behaviors whenever possible.

b. Teachers demonstrate social as well as cognitive skills, and arrange opportunities for children to observe each other engaging in constructive behavior.

c. Teachers lead children in discussion of the reasons why some behaviors are more appropriate than others. Such discussions are held during times when appropriate behavior is occurring.

4. Children learn from each other. They learn skills by observing each other, and they communicate information to one another. In addition, the egalitarian nature of peer interaction provides a unique forum for the development of cognitive and motor as well as social skills. Communication skills are improved when children have ample opportunity to practice exchanging information with a variety of companions.

Implications:

a. The physical environment of the preschool is structured to facilitate cooperative group activity.

b. Teachers encourage and create opportunities for cooperative play and conversation. Children are encouraged to present their own ideas for group discussion and to comment on ideas presented by teachers and by other children.

Academic Content

In academic content areas, intellectually advanced preschool children have progressed far beyond the usual preschool curricula. They are ready and eager to learn concepts not usually taught until children are older. Academic activities designed for older children, however, often require children to carry out teacher-directed tasks while sitting still and concentrating on written worksheets, or to read and carry out written instructions independently. Many preschool children quickly lose interest in activities presented in these formats. Often children are simply unable to read instructions. Advanced activities can be adapted for use with bright younger children by breaking lessons into short units, by varying locations of work within a lesson, by giving visual demonstrations whenever possible, by presenting activities in a game-like format, and by providing attractive materials so that each child has something to hold and manipulate during the lesson. Teachers must also

have an acute sense of timing. They must know when to change an activity before children become bored, and when to allow children to continue and elaborate on a project which has captured their enthusiasm.

Teachers as Observers

The emphasis on individual programming at the Child Development Preschool requires that teachers be excellent observers of children. Ongoing evaluations, based on constant observations of the interaction of program and children, provide a crucial basis for program planning. Teachers write daily evaluations of their lessons and of individual children's reactions to them. Daily teachers' meetings allow for in-depth evaluations of the total progress of individual children. At the end of the year, final reports are prepared based on cumulative written observations by each teacher. (A sample final report is attached.)

The staff has prepared a list of things to notice about children's behavior in a preschool setting to help teachers expand their awareness of relevant children's behaviors. The following list is designed to serve as an informal observation guide, to help focus attention on the many different ways children display advanced intellectual abilities in the classroom.

Things to Notice About Children's Behavior

1. Notice when a child uses advanced vocabulary correctly, or when a child asks about new words heard in a story or lesson and then practices that word.

2. Notice when a child uses metaphors or analogies. For example, a child might say that moss on a tree is like an old man's beard, thus going beyond the simple perception of moss.

3. Notice when a child spontaneously makes up songs or stories, particularly when these elaborate on new experiences, or when they involve "playing" with the pronunciation of words, rhymes, rhythms, etc.

4. Notice when a child makes interesting shapes or patterns with small blocks, large blocks, pounding board shapes, play dough, or drawing materials. Notice if the child attempts to copy a pattern, or if the pattern created is symmetrical. Notice also elaborate or unusual artwork in any media. Take pictures, or make drawings of the most interesting creations, and notice the process children go through as they plan their work.

5. Notice when a child appears to modify his/her language for less mature children. For example, a child might appropriately shorten sentences, use less sophisticated words, and change his/her pitch when speaking to very young children.

6. Notice when a child displays skill in putting together new or difficult puzzles, particularly if the child examines the shape of puzzle pieces and seems to know where to place them without trial and error.

7. Notice when a child says or does something that indicates a sense of humor. For example, a child might pretend that the characteristics of one thing belong to another, as in a dog meowing.

8. Notice when a child expresses an understanding of abstract concepts such as death, time, electricity, etc.

9. Notice when a child masters a new skill, a new concept, or song, or rhyme, with unusual speed, or when a child demonstrates a competence which has been presented in a lesson some time previously. For example, recently a child used construction paper to put together a witch all by himself. The method had been demonstrated by a teacher some weeks earlier.

10. Notice when a child seems capable of locating him/herself in the environment. For example, does the child seem to know where everything is in the room and in the school building; can the child tell you how to get back to the school when on a walk; does the child maneuver his/her trike skillfully around the yard and seem to know when a space is too small to drive through; does the child understand how to keep out of the way of the swing, etc.?

11. Notice when children use language for a real exchange of ideas and information among themselves. Record what was said, if possible.

12. Notice when a child becomes totally absorbed in one kind of knowledge. For example, a child might spend all his/her free time with cars and trucks, draw only cars and trucks, want to read books about cars and trucks, and talk knowledgeably about different types of cars and trucks.

13. Notice when a child displays great interest and/or skill in ordering and grouping items. For example, a child might create block constructions which are systematically organized by shape, or sort toy vehicles by size and type, or spontaneously arrange pegboard pieces to form a rainbow-ordered color series.

14. Notice when children take apart and reassemble things with unusual skill.

15. Notice if a child identifies left or right, both in relation to his/her own body and the body of another person, or if a child understands how to move to the left or the right.

16. Notice when a child remembers and makes mental connections between past and present experiences. For instance, a child might spontaneously apply a principle learned in a group time about mammals to another lesson, weeks later, concerned with dinosaurs.

17. Notice when a child behaves in a way which indicates sensitivity to the needs or feelings of another child or adult. For example, a child might spontaneously help up another child who had fallen, or might move out of the way of another child without being asked.

18. Notice when a child is able to carry out complex instructions to do several things in succession, or when a child is able to absorb several new concepts in a single session.

19. Notice when a child is unusually attentive to features of the classroom environment. For instance, a child might frequently be the first to notice a small change in the arrangement of the room, a teacher's new hairstyle, or a different picture on the wall.

20. Notice when a child uses verbal skills to handle conflict, or to influence other children's behavior. For example, a child might use verbal skills to initiate a favorable toy exchange, to decide peer group activities, and in general to exercise leadership.

No "Best" Curriculum

A final implication of the diversity among intellectually advanced children and the uniqueness of their individual patterns of strength and weakness is that no single prespecified curriculum can be prescribed as the "best" way to teach gifted children. A good school program is a dynamic event, and is created anew each day from the interactions of particular children with particular teachers over particular intellectual problems of interest to them.

The specific curriculum ideas and lesson plans which follow should, therefore, be considered as suggestions rather than prescriptions. Certain areas have been explored because of the particular interests of the teachers and children at the Child Development Preschool. Other teachers and children might evolve a different, equally effective, program in harmony with their own needs and experiences. Creative teaching is the essential ingredient in any program, and creative teachers will work most comfortably with curricula they themselves have adapted and developed.

As part of our effort to adapt materials for use with intellectually advanced preschool children, the Child Development Preschool periodically invites experts to hold workshops for our staff and other interested educators and parents, and to prepare papers detailing their ideas on curriculum development. Two of these papers are attached--"A Program of Creative Dramatics for Intellectually Advanced Preschool Children" by Claire Leary and "A Program of Math Instruction for Very Young Gifted Children" by Nancy Cook. Others will be made available as they are prepared.

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Chapter 4

Planning for the Learning of Social Skills

The development of social skills is emphasized throughout every aspect of the preschool program. An important component of any educational program for young children, social skills training may be particularly crucial for intellectually advanced children who may frequently find themselves in peer groups where they do not "fit in" easily. A three year old, for example, who knows the Latin names of all the dinosaurs and can converse articulately about their habitats and behaviors may have difficulty communicating with more ordinary children who have not memorized several books on the subject. It is easy for such "different" children to develop maladaptive patterns of social behavior which will make forming friendships difficult.

Social skills emphasized at the Child Development Preschool include the following:

--Independence: Children assume responsibility for self-help routines; they learn to direct their own activities, make decisions, and follow through on their plans; they learn to focus their attention and continue their own activities when others are near.

--Assertiveness: Children learn to stand up for their rights in non-violent, assertive ways; they learn to express needs and emotions effectively without resorting to crying or whining.

--Social sensitivity: Children learn to interpret and understand the needs and feelings of other people; they learn to help, share, and cooperate with others.

--Friendship-making skills: Children learn to interact with other children and with adults; they learn how to ask others to join group activities and to respond appropriately to overtures from other children; they learn to mesh their own interests with those of others while participating in group activities.

--Social problem-solving skills: Children learn to negotiate differences, and to solve conflicts without resorting to physical violence.

Several different factors combine to facilitate the development of these skills. The arrangement of the physical environment plays an important role in determining the types of social behaviors children are likely to engage in. A well-planned physical environment can eliminate the need for constant direction from teachers (see Kritchevsky & Prescott, 1969, for an interesting discussion of this topic). Child-size shelves, tables, and lockers make it possible for children to manage their own clothing and equipment and participate in set-up and clean-up activities. Attractive materials arranged in interest centers stimulate child-initiated activity. Materials that stimulate social interaction are arranged to encourage small groups of children to develop activities together. For example, dress-up materials and a housekeeping corner invite group fantasy play; swings are hung in pairs to facilitate conversation between swingers; and so on.

Often a simple rearrangement of furniture can resolve recurring social difficulties. Conflict in the block area is reduced, for example, when tables are moved so that the natural pathway between two interest centers does not pass through the building area. Inappropriate indoor running and chasing can be reduced by breaking up overly large spaces with shelves and tables.

Scheduling a smooth flow of events also contributes to positive social behavior. Sufficient time is provided during transitions between activities to allow children to handle their own self-help needs without being rushed. At the same time, materials are set up in advance so that children need not wait for events to begin. It is particularly important to provide activities sufficiently interesting and challenging to direct children's natural energy toward problem-solving. Like all children, intellectually advanced children may become disruptive, or withdrawn, when they are bored. However, they require more complex activities to maintain their interest than most children their age.

Social skills are also taught through planned teacher interventions. Children are led through self-help routines step by step. Teachers gradually withdraw physical and verbal guidance as children become more proficient. Teachers encourage frequent discussions concerning the

social consequences of behavior at times when appropriate behavior is occurring. Such discussions might range from a brief comment--e.g., "When you keep the sand in the sandbox, it doesn't get in anyone's eyes"--to a guided discussion of how two children might equitably share a truck. Stories and puppets are used to dramatize hypothetical social conflict situations. Children are asked to suggest and evaluate different solutions.

Teachers are constantly aware of the effects of their attention on children's behavior. It has been shown repeatedly that children's behavior which is immediately followed by adult attention tends to increase, while behavior which receives no attention tends to decrease in frequency. Teacher attention can include such events as comments or questions; physical contact such as a pat or hug; standing or sitting close by while watching, nodding, smiling, and listening; or bringing extra materials to a child or group of children. In practical terms, this means that teachers focus their attention on children's appropriate behaviors, and ignore inappropriate behavior whenever possible. Misbehavior which cannot be ignored is stopped in a matter-of-fact manner, with little comment. This positive approach of focusing on children's strengths and successes contributes to helping each child develop feelings of self-esteem and self-confidence.

Directive statements from teachers are kept at a minimum, so that children form the habit of taking the initiative for their own behavior. When directions are necessary, they may be imbedded in a contingency statement, letting the child know what must be accomplished before other events can happen. For example, a teacher might say, "As soon as you clean up the blocks, you'll be ready for snack." The initiative for carrying out the behavior still remains with the child. Likewise, negative contingency statements are used to inform children of consequences of their inappropriate behavior. For example, a teacher might say, "If you crash the trike again, I'll have to put it away."

Teachers are alert to possible conflict situations, and intervene when necessary to guide children to a peaceful resolution. If one child

physically attacks another, the teacher would come between them, focusing attention on the victim and ignoring the aggressor. The teacher helps the victim to make appropriate assertive responses. A teacher might suggest, for example, that the victim say "No hitting!", or "I'm playing with this truck now." If a child is attempting to snatch a toy from another, a teacher might suggest that the child ask for its use, and then either reinforce the peer cooperation which may follow, or help the child accept no for an answer. If children have already demonstrated their knowledge of a variety of social conflict-solving techniques, teacher intervention may be less direct. The teacher's comment might be limited to a statement such as, "It looks like you two don't agree. I wonder how you might decide together how this garage might be built."

These and other principles of behavior management are discussed in more complete detail in the book, Social development in young children (Roedell, Slaby, & Robinson, 1977).

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Chapter 5

Planning for the Learning of Physical Skills

Physical skills are those skills which enable children to respond to, explore, manipulate, and control the physical environment through the mastery of increasingly complex and coordinated bodily movements.

Large motor skills include walking, running, climbing, pushing and pulling, swinging, jumping, rolling, sliding, throwing, catching, hitting, digging, lifting, carrying, pedalling and steering wheel toys. The development of large motor skills is facilitated by daily outdoor play periods in a large outdoor play space containing a variety of surfaces, such as grass, sand, gravel, cement walks, and steps. Outdoor equipment includes swings, climbing frames, trees, and sandboxes. Much of the equipment at the Child Development Preschool is moveable and can be used in a variety of arrangements. Such equipment includes large wooden boxes; wooden walking, jumping, and sliding boards; and ladders. Wheel toys, balls, pulleys, shovels, sand toys, large hollow blocks, and carpentry equipment are also useful additions.

Teachers observe each child's progress in large motor skill development, and rearrange the equipment to accommodate increasingly complex skills. Walking boards stretched between two boxes, for example, are kept low for children just learning to balance, and raised higher to provide a challenge for adept climbers. Periodic rearrangement of climbing equipment sparks renewed interest in practicing climbing and balancing skills. Teacher encouragement and involvement in all aspects of large motor play is essential to encourage timid children and to reinforce safe use of equipment.

Special planned activities designed to reinforce particular large motor skills can take place either in or out of doors. Elementary tumbling, practice in walking a balance beam or keeping feet together on a straight line, throwing and catching balls, moving rhythmically in different ways to music, can all be introduced in a game-like format.

Small motor skills usually involve eye-hand coordination activities, and include putting into, taking out, putting together, taking apart, manipulating, stacking, buttoning, turning, pouring, cutting with scissors, use of tools, writing or drawing with pencil, pen, crayon, or paint brushes. Fine motor skill develops as children practice using a variety of materials and equipment. Faucets, door handles, coat hooks, storage shelves, and drawers within easy reach of children facilitate use of small muscles. Space and time to work at comfortable tables or on the floor with equipment such as peg boards, puzzles, beads, blocks, dolls, housekeeping equipment, transportation toys, construction sets, carpentry equipment, and art materials allow children to develop dexterity and eye-hand coordination. By carefully observing each child's progress, teachers can provide increasingly complex projects matched to the skill level of the child. Teachers avoid taking over projects for children who are having trouble, but instead offer encouragement and possible suggestions for the next step, verbally guiding the child to success.

Teachers should be sensitive to the fact that the planned projects conceived by intellectually advanced children frequently demand an advanced level of physical skill which the child may not possess. Children may become frustrated when their constructions do not match the perfection of their conception. Conversations acknowledging the difficulty of the project, and pointing out that sometimes things just don't work out as planned can help children deal with this frustration. Hints such as "what might be another way to do it" can help children deal constructively and flexibly with frustrating difficulties.

Chapter 6

Teaching Mathematics*

Curriculum Goals

The teaching of mathematics to intellectually advanced children at the Child Development Preschool involves the simultaneous exploration of several areas of the universe of mathematical thinking. These include:

1. Number work--the names and sequence of numerals; counting; numerals as the representations of sets; the "oneness of one and fiveness of five;" sequencing; the constant intervals between numbers; ordering; one-to-one correspondence; the concepts of greater than, less than, and equality; the money system; addition, subtraction, multiplication and division.

2. Measurement--the physical properties of solids and liquids, weight, volume, height, length, width, area, diameter, time.

3. Graphing--the language of pictorial representation of mathematical concepts.

4. Geometrical concepts--straight lines; curves; verticality; horizontality; perspective; parallelism; perpendicularity; angles; symmetry; properties of geometrical shapes; relationships among shapes.

5. Logic--the development of logical thinking, including sorting; categorization; forming sets, subsets, and intersecting sets; creating, recognizing, and recreating patterns.

Activities and goals pursued in the mathematics curriculum are guided by an understanding of the development of logical mathematical thinking as described by Jean Piaget. A more detailed explanation of children's developmental stages of thinking together with implications

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*This chapter is based on an outline and lesson plans prepared by Anne S. Hall.

for the teaching of mathematics is provided in the attached paper, "A Program of Math Instruction for Very Young Gifted Children" by Dr. Nancy Cook.

Goals for individual children are established in coordination with each child's current level of competence. Individual goals are revised as children acquire new skills and move to more advanced stages of thinking. The general goals of mathematics teaching at the preschool are described below, although not all goals are applicable to a particular child at a particular time. Many children may not achieve the more advanced goals before leaving the program.

1. In number work:

   a. Children can recognize and name all numbers (first 0-9, then 10-19, then 20-99, then 100-999, on up).

   b. Children can count (first by ones, then tens, then hundreds, then fives, then twos).

   c. Children can count objects in sets.

   d. Children can sequence objects by size, time, and other criteria.

   e. Children can identify sets with equal numbers of members, then compare sets of greater and lesser numbers of members.

   f. Children can add together two sets, then three or more.

   g. Children can subtract members of sets.

   h. Children can rename sets by their addends (4 = 1 + 3, 4 = 2 + 2, 4 = 3 + 1).

   i. Children can divide sets into fractions.

   j. Children can divide sets into factors.

   k. Children know the value of coins in our money system, can make change, add together and subtract coins, use money.

2. In measurement:

   a. Children can properly use such terms as full, empty, half-full, more, less, longer, shorter, wider, narrower, heavier, lighter.

   b. Children understand and can predict the constancy of matter.

   c. Children discover and can predict the relationships among weight and volume, height, length and area; diameter and circumference, etc.

   d. Children can measure weight, volume, height, width, length, area, and diameter by various measures (e.g., the table top is as long as 5 blocks).

   e. Children learn and can use metric and standard English measurement systems.

   f. Children understand the length of time involved in and can properly use the terms second, minute, hour, day, week, month, year.

   g. Children can tell time, first by hour, then half-hour, then quarter-hour, then minutes.

3. In graphs:

   a. Children can make graphs to record mathematical findings.

   b. Children can read graphs.

4. In geometrical concepts:

   a. Children can recognize and name in structures or drawings they make, or in the physical environment examples of straight lines, curves, verticality, horizontality, parallelism, perpendicularity, angles, symmetry.

   b. Children can create examples of these concepts.

   c. Children can name and know attributes of various plane and solid geometric shapes.

   d. Children can form desired geometric shapes by combining other shapes.

   e. Children can correctly identify relationships among geometric shapes (e.g., 6 equilateral triangles can form a hexagon).

5. In logic:

   a. Children can identify, create, and recreate patterns.

   b. Children can sort objects into logical categories by attributes.

   c. Children can form sets, subsets, and intersecting sets using attributes. Numbers of attributes used to define sets can be gradually increased.

   d. Children can identify criteria by which given sets have been formed.

Since intellectually advanced preschool children are capable of working in areas generally attacked only by much older children, most of the available materials are designed for use by older children and must be adapted to the needs of preschoolers. Individualized "math center" programs, for example, require an ability to read and to pursue an extended problem on one's own. While some preschool children have these abilities, many lack one or both. Group lessons designed for older children require an ability to concentrate on teacher directions and an interest in attacking teacher-directed problems. Many programs require abstract thinking without the support of manipulatives. Again, such activities frequently fail to inspire most young children. In our experience, intellectually advanced preschoolers seem to work best when provided with attractive manipulatives from which they can make discoveries with a minimum of reading and a minimum of structured teacher direction. Teacher direction works best when offered in a game-like format. A teacher might suggest, for example, "Here's a hard one--who can tell me . . .", or "Let's see who can find . . . ."

When teaching mathematical concepts in a teacher structured session, we have found it essential to divide the children into small groups of six or seven, so that extensive individual attention and reinforcement can be given to each child's efforts. A variety of short activities is generally more effective than a single long lesson. Occasionally, however, some children will become so involved in pursuing a particular concept that the teacher would be wise to follow their inquiry, abandoning other activities planned for that lesson.

Mathematics teaching need not be limited to teacher-structured lessons, however. Mathematical concepts are part of everyday living. Many preschool activities lend themselves to mathematical explorations. The alert teacher can seize appropriate opportunities for extending mathematical inquiry.

In the outdoor play area, teachers can set up stores and banks to stimulate the use of money. Children also enjoy treasure hunts using and making maps; comment on the angles made by walking boards or slides, and use a level to measure slopes; use words such as higher, lower, faster, slower, longer, shorter; provide measuring containers and balances for use in the sandbox; point out changes in perspective from high and low places in the yard; count as children climb rungs of ladders or are pushed in the swing.

During free play indoors, a variety of materials can be made available for independent discovery. A sand or water table with graduated beakers stimulates measurement activities. As children build with blocks, teachers can comment on geometric forms that are constructed, note when two or more blocks are used to equal the length or shape of another block, or remark on symmetry and balance in the buildings. Blocks, dishes, and other materials can be stored in logical spots which call for sorting and classification as they are put away. Teachers can use the word "set" in noting what objects children are using in their play. (Children rapidly learn to conceive of the world around them as a series of sets. An example of this occurred during a discussion with one four-year-old about what he would be when he grew up. "I'll be a fireman," he said. "No, I'll be a doctor." "Well, which is it--fireman or doctor?" "Intersecting set!," he exclaimed, "I'll be a paramedic, like on Emergency.") Comment on one-to-one correspondence, and equal and unequal sets (e.g., are there more things in the set of children than in the set of pens; are there just as many chairs as there are children, etc.). When children are using playdough or clay, comment on the shapes of the dough, how children are adding to, taking away from, or dividing their dough. Use terms such as more, less, longer, shorter, taller, wider,

narrower, empty, full, half, whole. As children use art materials, point out geometrical forms and patterns, balance, and symmetry.

Graphs can be adapted for use in all areas of the curriculum. In science, children can graph the results of their experiments. In social studies, the relationships among people, families, and societies can be graphed. A graph might be constructed, for example, of pets owned by different children.

The following sample lesson plans have been used successfully with small groups of six or seven children ranging in age from two to five. Children at the Child Development Preschool are grouped for such activities by competence level. When planning to use these or similar activities, it is important to match the activity with the developmental level of the children involved. Not all activities will be successful with all children.

Sample Lesson Plans--Mathematics

Graphing: To familiarize children with mathematical language of graphs

Equipment:

magic markers
pencils
tape
two large pieces of paper or cardboard, to make charts
rubber cement
small rectangular pieces of paper
list of children's birthdays

Procedure:

Use one large piece of paper to create a chart containing two lists. On one side, list children's names. Allow each child to write his/her own name, or write it for them. On the other side, write a list of the 12 months of the year. Ask each child the month of his/her birthday. Help them look up the date if necessary. Help the child find his/her birthday month on the chart, draw a line from his/her name to the birthday month. Emphasize the terms "_____ was born in _____." When the

chart is finished, help children read it by pointing out which child was born in which month.

The second graph will be a bar graph, showing how many children were born in each month. List the months across the bottom of the graph. Pass out small rectangular sheets of paper to children, and have them write their name or initial, or perhaps draw a picture of themselves. Have children glue their name above the month in which they were born. Discuss how to read this graph. Similar graphs can be designed illustrating kinds of pets children have, colors of clothes, eye color, and so on.

Cuisenaire rods: Children develop the concept of number

Equipment:

set of cuisenaire rods for each child
8 x 10 sheet of paper
pen and crayons in the same colors as rods

Procedure:

Distribute rods to children. Allow free play. (If this is the children's first exposure to the rods, they may want to investigate them freely for several sessions before engaging in a structured activity.) Explain that some children may want to continue playing with the rods, while others may want to try some of the problems the teacher will present. Pose problems to children who are interested as follows. Trace the orange rod on the paper using the orange crayon. Ask the children what other rods put together will be just as long as the orange one. Draw their solutions. Show a tracing of 2 white rods. Ask which rod is just as long. Draw their solutions. Continue with similar problems. In each case, encourage children to experiment with their own rods to find solutions. Children may want to trace their own rods, depending on their fine motor skill. Tracing may interfere with free exploration of the rods, however. Young children seem to respond better to seeing visual representations of problems, as in the tracings, than to purely verbal questions.

Sets: Children understand the concept of sets

Equipment:

1) pictures of objects which can be formed into various sets, for example, people, animals, birds, fish, machines, foods, things that are blown by the wind, brown things, red things, things with wheels, etc.
loops of yarn to form sets and subsets

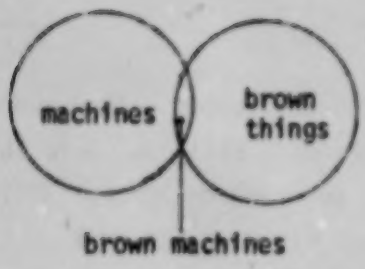
2) small objects to sort (such as pegboard pegs, animals, vehicles, blocks)
ten paper muffin cups for each child
paper and crayons to record solutions

Procedure:

1) Give each child about five cards. Seat children in a circle on the floor, or use a big feltboard and seat them around it. Arrange a big oblong of yarn within the circle of children, or on the feltboard. Have children lay down their cards around the edge of the oblong, outside of it. Then name the criteria for forming that particular set (for instance, talk about what would be included in the set of all the animals). Have children put cards in the oblong which fit in that set.

After several sets have been formed, introduce subsets. Once "all the animals" are in the loop, put a smaller loop inside the larger loop. Say, "This is the set of all the animals. The small loop is for all the animals that fly."

As children become adept, introduce the concept of intersecting sets (several lessons may be needed before children arrive at this point--follow their lead). Put two loops in front of the children. One loop may include a set of, for example, machines, while the other should be something which might include some machines, such as "all brown things." As children are forming the sets, they may discover some objects which belong in both sets. Move the yarn of one set toward the other until they overlap. The brown machines can fit into the overlapping section.



2) Move the children to a table. Give each child a bowl of small objects to sort into muffin papers. Suggest the children divide objects into sets, each set into a muffin paper. As they sort, ask them to name each set. Point out differences in the way children sort. Give each child crayons and paper to draw their sets. Suggest they trace, draw, or count and record the names of their sets.

Attribute blocks: Children learn to recognize and distinguish among attributes, and to recreate visual patterns

Equipment:

set of attribute blocks--small blocks which vary systematically in color, shape, and size

(construction paper or cardboard can be used to create a set)

Procedure:

1) The teacher takes a set of blocks of the same color, varying only in shape and size, and puts them out in an ordered pattern. Cover the pattern and remove one block. Have children guess which block is missing. Change the pattern and repeat the exercise several times.

2) After children have had experience guessing as a group, give each child a set of blocks of one color. Have each child choose a partner. Have each child make a pattern, and close his/her eyes while the partner removes one block. The child must guess which block is missing.

3) Have children choose four blocks and make a pattern. Have the partner observe, and copy the pattern with his/her own

blocks. Switch and repeat. Increase numbers of blocks as children become more skilled. More than four blocks may be too difficult for some children. Start with less complex tasks to insure success, and work up.

Geometrical shapes: Children learn to categorize by attributes, and learn attributes of various geometrical shapes

Equipment:

pairs of objects in several shapes--one pair for each child, plus one extra object to give the last child a choice
covered basket or box
several sizes of balls, cylindrical and rectangular boxes
one large cardboard box for each shape

Procedure:

1) Have each child choose one shape (matching shapes are in a covered basket). Have each child close his/her eyes, reach into the basket, and try to find the shape identical to the one he/she is holding. The task is harder if all shapes are of the same size and material.

2) Hold up a ball. Ask children what shape it is (ball, round, sphere). Explain that "we are going to sort some shapes." Introduce other shapes, one at a time. Give each child (or pair of children) a large cardboard box. Ask, "who would like to take charge of the balls?" Put a ball in their box. Ask, "who would like to be in charge of cylinders," and so on. When each box is assigned and has one object in it, hold up other objects, one at a time. Discuss shape, and ask whose box it should go in. Continue until all are sorted.

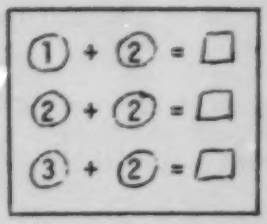
Addition: Children learn the concept of addition, using blocks as counters

Equipment:

set of 8 small blocks (4 each of 2 colors) for each child
problem sheet for each child, pencil and eraser
sample problem sheet for teacher

Procedure:

Prepare problem sheets for addition problems. Complexity depends on skill level of children. Children just beginning should start with sums less than five. Spaces holding numbers in each problem should be large enough to hold blocks.



Show children teacher's example sheet. Explain the first problem. Place 1 block on the 1, 2 blocks on the 2. Ask children how many there are all together. Count up the blocks, and record answer. Continue with the rest of the problems.

Hand out individual problem sheets, blocks, pencils, erasers. Help children use blocks to solve the problems. If children have difficulty writing their answers, form the numbers with dots so that they can trace them after they have discovered the sum.

Geoblocks: Children become familiar with various geometric shapes and the relationships among shapes

Equipment:

geoblocks--small blocks formed in different geometrical forms
small piece of paper for each child (about 2" x 3")
shapes made by tracing different combinations of geoblocks, varying degrees of difficulty

Procedure:

Place basket of blocks in center of table so that each child can reach it. Give each child a small piece of paper. Ask them to cover the whole paper, so that no one can see any of it. Reinforce all placements of blocks such that angles fit perfectly, and no paper shows through.

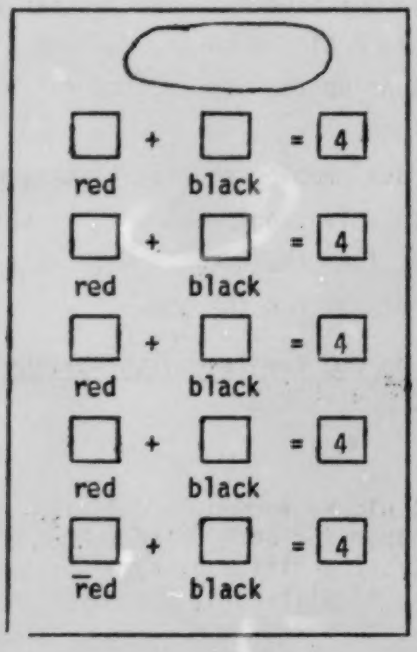
As children finish or tire of this activity, give them cards with traced shapes to fill in with their blocks.

Addends: Children can rename sets by their addends

Equipment:

1) feltboard
   yarn loop
   2 sets of 3 animals each
   feltboard numbers, enough to write: 1 + 2 = 3, 2 + 1 = 3, 3 + 0 = 3; 0 + 3 = 3

2) pencils, erasers for each child
   2 sets for each child of four blocks in each set, each set a different color (e.g., four red blocks and 4 black blocks)
   problem sheet for each child, and sample sheet for teacher



Procedure:

1) Put yarn loop on feltboard. Put animals (e.g., squirrels and elephants) on board above loop. Ask children to put some squirrels and elephants into the set, to make three animals in all. Once done, ask how many animals are in the set. Put a "3" next to the set. Then ask, "how many squirrels?" Put number "1" or "2" below the set. "How many elephants?" Put that number below the set. Point out that "2 plus 1" is

another way to name "3". Substitute 1 animal for another so that the set illustrates "1 plus 2". Have the children place these numbers below the set. Then move on to "3 plus 0", "0 plus 3".

2) Move to a table. Demonstrate the problems sheet, using blocks. Say, "I'm going to put 4 blocks in this set. How many red blocks are there?" Write the number in the red box. "How many whites?" Write the number in the white box. Point out that 3 + 1 (or whatever) is one way to rename 4. Ask if the children can think of other combinations that rename 4. Have them place the blocks in sets, then tell you what number to write in.

Next, give each child his/her own sheet and blocks. Dot in numbers for children to trace if they have trouble writing them, or write the numbers for them so that writing does not get in the way of problem-solving.

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Chapter 7

Teaching Science*

Curriculum Goals

Scientific thinking is intricately related to the study of mathematics, and principles and activities discussed in the previous section are equally applicable to the teaching of science. The teaching of science involves guiding children to think systematically about the world around them--to stimulate and encourage their natural curiosity and provide them with the tools of scientific methodology which will help them discover the answers to their questions. Children's ability to think and reason logically develops gradually, and is enhanced by providing a variety of experiences which allow them to explore, manipulate, experiment, and draw conclusions on their own. In the science curriculum, children are guided in forming hypotheses, testing their predictions, observing the results, and evaluating conclusions. Activities are provided to enhance children's powers of observation, and encourage them to notice details, and detect patterns and relationships. They are guided in communicating their observations and conclusions orally and by use of charts, graphs, and models. Science also involves helping children acquire skills in using tools and equipment and in using books to find additional information.

The goals of the science curriculum can be implemented throughout the day in every area of the children's experience. As children play outdoors, teachers can initiate discussions concerning the weather, the changing seasons, and other natural phenomena. Productive questioning is open-ended, to stimulate discussion and further discovery. An outdoor space containing a variety of surfaces--sand, gravel, dirt, concrete--

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*This chapter is based on lesson plans prepared by Joy Menke and Nancy Pratt.

offers opportunities for exploration of the properties of these different materials. At the Child Development Preschool, for example, a great deal of outdoor time has been spent by children digging trenches down the side of a small hill, pouring water from the top, and trapping the flow in a series of reservoirs. This child-initiated project involved a variety of discoveries, as children explored the properties of water and mud, the effects of gravity, and the use of shovels as levers to move heavy rocks clogging their reservoirs.

As children build with blocks, teachers can encourage experimentation with different types of structures, and help children discover what types of support are necessary to keep a structure sturdy. Blocks can also be used as levers, or as ramps to use for rolling wheeled toys and discovering the properties of different slopes. As children paint, they can experiment with color-mixing. They can predict what colors will be formed with different combinations, test their predictions, and obtain immediate feedback. The water-table provides endless opportunities for exploration of the properties of liquids. Magnifying glasses and microscopes allow children to examine many ordinary objects from a different perspective. Snack and lunch time provide opportunities for discussion of the nutritious qualities and origins of a variety of foods. Children are born scientists--they need only be provided with sufficient opportunities and freedom to carry on their experiments.

The sample lesson plans that follow barely touch on the myriad possibilities for guiding children's scientific discoveries and sharpening their discovery skills. There are many books on the market which contain suggestions for science experiments to do with children. The most exciting series we have found, however, is Science 5/13, a project sponsored jointly by the Schools Council, the Nuffield Foundation, and the Scottish Education Department. This invaluable series of books is published by Macdonald Educational, 850 Seventh Avenue, New York, New York 10019. The series consists of units dealing with various subject areas in which children are likely to conduct investigations. While not designed specifically for intellectually advanced children, the child-centered, hands-on, discovery methods described in these books

provide an ideal vehicle for elaborating the advanced thinking skills of such children.

Sample Lesson Plans--Science

Sound discrimination: Children learn to discriminate and classify sounds, and record results

Equipment:

pairs of boxes containing different material--e.g., coins, rice, seeds, small blocks, etc.
masking tape

Procedure:

Arrange masking tape on floor in a series of squares to aid in charting of results. Hand each child one of the pairs of boxes. Children shake the boxes, and take turns finding the box which matches the sound in theirs. Children can predict what might be inside the boxes, and check their predictions by looking in the box. As matching pairs are located, children can place the pairs in masking tape squares on floor.

Body space: Children learn to predict the size of space taken up by their body, learn to use measurement skills, discuss concept of "big" and "small"

Equipment:

blocks

Procedure:

Divide children in pairs. Explain that each person's body takes up a certain amount of space. Discuss whether this amount might be large or small. Have each child build a space around his/her partner's body, using blocks. Children might predict how many blocks will be used. When space is completed, discuss how large or small it is in comparison to other spaces and objects in room, how many blocks were used, etc. Have partners change places and repeat activity.

Cooking: (Cooking requires the use of skills from all areas of a school curriculum and is included as part of science only for the sake of convenience.) Children learn to read and follow directions, perfect measuring skills, predict and observe changes related to different combinations of ingredients and application of heat. Eventually, children can learn to invent their own recipes, as they become proficient in understanding the properties of different ingredients.

Equipment:

recipe, written in large print on tag board for easy reference
table, pans, ingredients required by recipe
heat source if required

Procedure:

Set out ingredients. Discuss each type of ingredient with children. Read recipe with children, and refer back to each step throughout the cooking process. Ask children to predict what will happen as different ingredients are added, and to observe the changes that do occur as ingredients are actually mixed. Discuss the function of applying heat, review time required for cooking and how it might be measured. Discuss the concepts of "not done" and "burned." Chanting and singing while children are taking turns mixing or waiting for items to be cooked helps pass the time. (Other cooking lessons might include discussions about the origins of different ingredients. Recipes from different countries can stimulate discussion of other cultures. Doubling or halving recipes can sharpen mathematics skills.)

For recipes, see:

Long, Betty, & Witte, Carol. Metric fun cooking cards. Teachers, P. O. Box 398, Manhattan Beach, Ca. 90266.

McClenahan, P., & Jaqua, I. Cool cooking for kids. Belmont, Ca.: Fearon, 1976.

McPhee Gribble Publishers. Cooking, making things to eat. Australia: Penguin Books, 1976 (a book in the Practical Puffin series).

Parents' Nursery School. Kids are natural cooks. Boston: Houghton Mifflin, 1974.

Wilms, B. Crunchy bananas, and other great recipes kids can cook. Salt Lake City: Sagamore Books, 1975.

Woodworking: 1) Children learn skill with tools, discover properties of different materials and experiment with different effects they can produce using tools and wood of different shapes. 2) Children explore the use of hinges, compare hinges to functions of their own joints and increase body awareness, discover properties of geometrical shapes joined in different combinations.

Equipment:

variety of tools, small and lightweight but of good quality--essential tools include hammer, nails, saw and clamps to hold wood in place
hinges
wood of various sizes, thicknesses, shapes, and colors. It is helpful to have several flat square pieces available for this particular activity.
sturdy workbench

Procedure:

Introduce children to woodworking equipment slowly. Demonstrate each type of tool, and explain safety precautions. Be sure to involve only small groups of children who can be adequately supervised by a teacher. Talk about safe use of tools, and point out ways children are using them safely. Allow children to experiment with the equipment. Do not insist that they "make something."

When children are ready, introduce them to hinges. Explain how a hinge works, and make comparisons with the joints of the body. Help children discover how two pieces of wood might be joined with hinges. As children become proficient encourage the creative possibilities inherent in the material. At the Child Development Preschool, several children discovered how to make birds, with hinged wings. Another child discovered that if four pieces of wood are hinged around a central piece, a folding box results.

Planting: Children become aware of factors necessary to make plants grow. Children predict what might be essential, and test their predictions.

Equipment:

different types of soils: topsoil, clay, sand, etc.
containers for planting
seeds of some quick-growing plants, such as beans, peas, or grass
paper and pens for recording

Procedure:

Discuss how plants grow. Read a story about seeds, look at pictures of seeds, etc. Make list of things children believe to be essential for plant growth. Ask children which types of soil they think might be most effective in helping seeds to grow, and suggest they test their predictions. Help children plant seeds in different types of soil. In addition, some seed containers might be placed in the dark, and leave others in the light. Children might also investigate the effects of watering a lot, a little, a medium amount, or not at all. Since children become very attached to the seeds they have planted, be sure each child has at least one plant that is likely to grow. Ask children to predict which seeds will grow best. Record their predictions. As seeds begin to sprout, have children observe their progress, and perhaps measure the plants as they appear. Compare results with children's predictions. A concluding lesson might involve revising the original chart of factors essential for plant growth.

Absorption: Children become familiar with process of absorption, learn to predict, test, observe, and record their conclusions.

Equipment:

several small transparent containers of colored water (colored water makes absorption process more obvious)
variety of materials to test--e.g., rock, sponge, paper, cloth square, crayon, nails
large chart divided into two columns: absorbs, does not absorb, pictures of test items, glue (This can be done as a group project, making a group chart, or children may want to make their own charts, depending on the amount of experience they have had with charting.)

Procedure:

Discuss with children what might happen when a rock is dropped into the container. Have each child drop a rock into their container. What did they observe? Have each child drop a sponge into their container. What did they observe this time? Discuss process of absorption, use term. Have children predict whether each of the other materials will

absorb water or not. Ask children to verify predictions, dropping each object into the water. Record results by glueing pictures onto appropriate column on chart. Children can also make their own charts as they continue their experiments. Another method of recording might be to sort objects into two piles--those that absorb, and those that do not.

As a variation on this experiment, ask children what might happen if a piece of paper towel were placed with one end in a clear cup of water and the other end in water colored with food coloring. Have them try it. (The clear water eventually changes color.) Suggest children see what happens when a strip of paper towel joins two cups of different colored water, such as blue and yellow. (The towel absorbs both colors, and produces a new color from the combination.)

Note: This same procedure can be used in other experiments, e.g., to discover which objects sink or float, to discover which materials dissolve in water, to discover which type of liquid causes ice to melt faster, etc.

As children become familiar with the procedures, materials for conducting each experiment can be left on the science table for children to use on their own during free time. Objects to be tested can be varied periodically to stimulate renewed experimentation.

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Chapter 8

Teaching Language Arts*

Curriculum Goals

The language arts curriculum focuses on skills in both written and oral language. Language arts includes the development of vocabulary, verbal reasoning ability, memory, verbal facility, and the appreciation of literature. Written language is presented as an extension of spoken language. Writing, spelling and reading are developed through emphasis on phonics skills and sight recognition vocabulary using the children's own words.

Goals of the language arts program include helping children develop a large, flexible spoken vocabulary; an ability to understand and use verbal concepts (e.g., such adjectives and adverbs as high-low, big-small, here-there, over-under, sooner-later, first-last); an ability to store and retrieve information; and an ability to express ideas and feelings with ease. As they show readiness, children are encouraged to develop the ability to print both upper case and lower case letters; to spell words; to sound out words phonetically; to recognize by sight a large number of words; and to read at whatever level his/her ability and motivation allow.

Many intellectually advanced preschool children are either reading at an advanced level or are ready and eager to learn reading and writing skills. However, many reading programs designed for older children are inappropriate for intellectually advanced preschoolers. Often such programs require children to carry out teacher-directed tasks while sitting still and concentrating on written worksheets. Some young children may be interested in worksheets, and able to concentrate on them. However,

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*This chapter is based on an outline and lesson plans prepared by Anne Hall, Elise Westmoreland, Joy Menke, and Claire Leary.

many children quickly lose interest in such materials, and may distract those children who are still working. Children are most likely to concentrate for long periods of time on writing, spelling, or sounding out words which they themselves have chosen.

Many reading programs require that children be arranged in groups of similar skill levels, and similar attention spans, and that children sit patiently and follow along while others read. Young children often grow impatient listening to another child read, and quickly lose interest if not allowed to go ahead at their own pace.

Given these constraints, one approach to reading which can be adapted to teaching intellectually advanced preschoolers is the "language experience" approach. The language experience approach is based on the use of the children's own language as a source of beginning reading material. Children's interest in reading and writing is at its peak when the words involved have special meaning for each individual child.

Activities utilizing each child's language include:

a) Key Word Vocabulary--Each child volunteers her or his "special word," and she/he then receives 2 cards with that word printed on each card--one copy to take home and one copy to leave at school. As each child's key word vocabulary increases, short stories can be created using the children's own words.

b) Individual Dictation--Each child is encouraged to comment on her/his drawings, "projects," or anything made by the child. This narration is then written down for the child to see. Children are also encouraged to dictate individual stories which are recorded and read back to the children.

c) News--In small group discussions, each child is encouraged to contribute a statement about herself/himself which is recorded by a teacher on a group chart, and read back with the children.

d) Cooperative Stories--A central theme is picked, either revolving around a particular selection of children's literature, an event at school, or a theme suggested by a child. A teacher elicits a sentence from each child (in keeping with the story sequence).

These activities are supplemented by a sequenced phonics program geared to children's individual abilities.

The sequenced phonics program includes:

a) Initial letter readiness (visual discrimination skills)

b) Identifying letters of alphabet

c) Matching upper and lower case letters

d) Learning to write upper and lower case letters

e) Learning beginning consonant sounds

f) Learning ending consonant sounds

g) Learning beginning consonant blends

h) Learning vowel sounds, beginning with short vowel sounds

i) Continue decoding/encoding words with skills acquired, depending on individual child's interest and ability

As is true in every curriculum area, the goals of the language arts program can be accommodated throughout the day as children pursue a wide range of activities. Language arts time is not limited to teacher-structured lessons. In all activities, teachers can encourage children to talk. Point out interesting objects in the environment, or bring into the classroom new materials to stimulate conversation among children as well as between teacher and child. As teachers ask open-ended questions to foster discussion, they can listen and encourage other children to listen while each child speaks. A teacher can facilitate conversation by sitting or stooping to meet children at their eye level. Avoid putting children on the spot by asking point-blank questions or by asking questions that are tests of knowledge rather than real requests for information. Conversation among children seems to flow most freely when children and teacher are engaged in a common quest for information interesting to both. For example, instead of asking each child what pet he or she has, a teacher might start the discussion by saying, "There are so many different kinds of pets people have. I have a dog, but I wish that I had a monkey. I wonder what kinds of pets other people might like to have." Reading a wide range of stories to children increases their vocabulary and broadens their knowledge, as well as providing additional focal points for discussion. Children's listening

and remembering skills can be enhanced by playing games such as "what's missing?," "Husker-Du," or "Concentration."

Teachers can point out letters and words as they occur naturally in the environment, and can hang signs labeling objects in the classroom. Playing rhyming games helps develop skills in attending to the sounds of parts of words. Singing a wide range of songs with children and encouraging them to create their own songs also reinforces this skill.

A listening center can be arranged, where children can listen to tapes or records of books and follow along in their own copies. Children can create their own books using drawings or cut-out pictures. Encourage questioning of unfamiliar vocabulary, and help children look up words in the dictionary.

The activities described below are just a few of the ways children might be encouraged in their experiments with language and symbol systems in the context of small group lessons.

Sample Lesson Plans--Language Arts

Traffic signs: Children develop awareness of uses of written language, and relationships between words and other symbols.

Equipment:

signs (can be purchased commercially or created by teacher) dealing with car safety
small cars to use in demonstration
paper, scissors, crayons, or pens for children to create own signs

Procedure:

Present signs, and explain that they are traffic signals. Give each child a small car. As each sign is shown, discuss what the word says, what it means, its shape and color, and what a driver should do when he or she sees the sign. Have children take turns demonstrating their understanding of the sign using their cars. When all signs have been discussed, suggest the children make their own signs to use either in the block play area or outdoors, directing tricycle traffic.

Word puzzles: Children develop better recognition skills, and skills in following directions.

Equipment:

Prepare word puzzles for each child, using letters in child's name (see example).

Sample:	B L Z K L M	L
	Z U B A K U	U
	O P D E K C	C
	O K E B L Z	E

L U C E

Procedure:

Direct children to write in each space the letter which follows the letter "K," then put the letters together to form the hidden word. Children become excited when they discover the hidden word is their own name.

Phonics: Children learn letter sounds. In this activity, children learn to verbalize the "mmmm" sound of the letter "m," and the "bbbb" sound of the letter "b."

Equipment:

collection of objects whose names begin with "m" and "b."
two trays with cloth covers, one for "m" items, one for "b" items
blackboard and chalk, or paper taped on a board and a magic marker

Procedure:

Write the letter "Mm" on one side of the board. Ask children to identify letter. Pull out the "m" tray, covered. Say, "I have some things on this tray. See if you can tell me what they are." Pull out one item at a time, as a surprise. As children name the items, repeat the word, emphasizing the m sound. When all items are named, ask if anyone can tell you what sound all these things start with. Name them again, with the children, emphasizing m. Ask if children can think of any other words that start with m. Write children's suggestions,

underlining m. (If children suggest words with m in the middle or at the end, the teacher can write the word and underline m where it occurs.) Repeat procedure with the "b" tray, and list "b" words on the other side of the board.

Combine all objects on one tray. Pass the tray around and have each child take two objects. Place one tray in front of the "m" list, and the other in front of the "b" list. Say, "Let's put all the things that start with "m" on this tray, and all the things that start with "b" on the other tray. Who has something for the "m" tray?" Collect items for each tray. Encourage children to repeat the names of their objects, and to indicate if it starts with "mmmm" or "bbbb."

Telephones: Children develop practical verbal language skills; become aware of the uses of the telephone; learn ways to use the telephone in an emergency; begin to learn their own phone number; increase communication skills.

Equipment:

as many "real" phones as are available
paper, yarn, scissors, pens to make "make-believe" phones

Procedure:

Introduce telephones, and discuss how they are used. Have pairs of children role-play conversations. Elicit response to such questions as (1) Why do we have telephones? (2) What do we do with telephones in an emergency? (3) Do you know how to call a friend? (4) What is in a phone book?

Lead children in inventing an emergency situation. Discuss what help might be needed, and what information must be imparted to the helping agency. Role-play emergency phone conversations.

Have children make individual paper phones, with separate receivers. Assist each child in writing his/her own phone number on the center circle, and in writing numbers 0 - 9 around the edges. Continue and encourage role playing with paper phones.

Story characters: Children learn to offer descriptive words about storybook characters based on oral reading of the story and short discussion; children increase vocabulary and literature appreciation skills.

Equipment:

story with interesting central character, such as Frederick from Leo Lionni's Frederick (New York: Pantheon, 1967)
chart with Frederick's head (or other character) drawn at the top of the paper, and "Frederick is" written under it
marking pen

Procedure:

Read story with dramatic intensity. Discuss story briefly with children. Elicit descriptive words about the character, and write them on the chart. Give clues if children begin to offer "silly" words. Read back the words with the children.

Dictation of group or individual stories: Children develop verbal fluency and ability to place events in logical sequence to form a coherent story.

Equipment:

either tape recorder, for recording dictation, or paper and pencil to write down children's words as they are spoken

Procedure:

There are a variety of ways to stimulate children to tell a story. The teacher might begin a story, leaving children with the question . . . "what happens next?" The teacher can keep children's attention focused on their story with provocative questions, such as, "Where did he live? What did he look like? What did she do then?" and so on. The teacher can provide props, such as hats, costumes, or equipment, and suggest the children develop a story that uses them. As children become familiar with story-telling technique, a tape-recorder can be made available to them to record stories during free time. The following are stories created by the children at the Child Development Preschool during the school year 1977-78.

3/16/77 Story created by three four-year-old-girls

A bear walks into the forest. He says, "Everyone thinks I am a scary bear, but you see I am really afraid of people." He walks on. "I have 26 children and cousins in my family." A hunter comes into the forest. He sees a woodpecker. The woodpecker says, "I am a woodpecker." The hunter says, "Oh." He walks further into the forest. Suddenly he meets the bear. The bear says, "You think I'm bad, but I'm really scared of you," and he ran away.

The bear came back and said, "I recognize you, you are the man who gave me tuna fish when I was a cub." The hunter and the bear kissed. "Let's go home together." The 26 cousins and other people in the family went home too.

Spring, 1977 An African Story About An Electric Eel
by a three-year-old boy

This guy was swimming under the water and he found something. It was fish food. He found it under water and he went up over the water and found another thing. He found a frog and he stunned it. He went back down under water to his under water cave, only safe for him, and he came out again with things to trap another fish with. So he went off, back over the water and looked for an alligator. He was going to trap the alligator. He found it and he stunned it. He took it way down in the water and he buried it. A stingray was under there. The stingray stung the alligator, and the alligator wanted to swim up but there was a big trap around the place where he was in the sand so when he came up he couldn't find any way out. He was trapped.

He went back and got some more things. He got some food and he ate it. Then he saw a special tool. It was a piece of paper. At the bottom of the water. He was happy from now on. He had as much food as he wanted and all the things from the ocean that he needed. So he had a great home under the ocean.

He went away. He went to a cave and he went in and he went back out of the cave. He got some more, and then he went up for breath. He stung another frog.

A Logging Camp Secret

A Cooperative Story by
five four-year-old children

Once there was a logging camp in the North woods. There was an amazing baby horse who lived there helping the loggers. He could hold two huge logs on his back and take them to the nearby river.

A flying fish lived in the river. She liked to fly up and down in the water. The horse began to cause a problem to the fish because the logs were pressing her down and she couldn't do her flying. She flew up to the horse and told him her problem. The horse suggested that she find another river. The fish said that she tried that river but the last time she flew there she saw a bear. The horse suggested another river he said he knew was safe.

While the fish and the horse were talking, another problem happened on a nearby farm. On the farm there lived a donkey, a baby pig, a dog, and surprisingly enough, an elephant. The man who owned the farm had brought the elephant back from Africa and was keeping him at the farm until he was ready to be taken to the zoo. Now the problem was this. The baby pig (who was always running away from his barn--he had just returned from a visit to the logging camp where he had become friends with the baby super horse) had overheard the man who owned the farm say they were going to get rid of the donkey because he wouldn't do any work. The pig ran to the donkey and told him. The pig ran and got his friend the dog and the three of them discussed how they could help the donkey escape. They decided to ask the elephant. They made a plan together. The elephant put his trunk over the fence. The donkey climbed onto the trunk and was lifted onto the elephant's back by the trunk. Next came the baby pig and then the dog. What a sight they were walking down the road.

The baby pig suggested they go to the logging camp for safety. When they got there the loggers agreed that the donkey could run free in their woods as long as he watched out for falling trees. The baby pig was kept as a pet by the man who owned the logging super horse. The elephant was invited to join the camp since he had such a good trunk for picking up logs but he decided he would rather live in a zoo. The flying fish did find a nicer river in the end and the dog and the elephant went home. To this day the man who owns the farm doesn't know what ever happened to the baby pig and donkey. The elephant and dog never said a word.

Spring, 1977 The Monster in School Who Ate the Children
by a four-year-old girl

Chapter 1

Though the monster was very small, he did eat children. He ate up all the things in the school, even the play yard. One thing he did not eat was the radiator: it was too hot (ha ha). He ate the teachers, he also ate the stapler, and the telephone, and the branches of the trees. He ate everything. Except one child who hid under the teacher's desk. Another one had played dead. Another hid under the stapler and another under the teacher's shirt. The teacher hid behind a small piece of paper. They could hide there because they were ants.

Chapter 2

The children used the monster as the school's guard dog. He played with the children everyday. Except one day he jumped over the stapler which was as high as the fence, and ran away. The next day the children came, and were very sad not to see their guard dog fenced in. Then they remembered: the stapler was the fence. But they were really out of luck that time. The guard dog remembered the children and dug his way out of the hole into the playground. The children were very happy to have their guard dog back.

Chapter 3

The guard dog had kind of a short tail, but he could eat steel. Then the children remembered, he could eat the stapler because it was steel. There was another thing bad about the school: it was steel.

"Oh-oh," said the boys, "the dog might eat the school!" The boy thought of ordering a metal school, but the dog could eat metal, too! Every kind of school the children ordered, the dog ate.

Finally the boy said, "I know, how about a paper school?"

"That's a good idea," they said. But when the paper school came, the dog ripped it up.

The dog's name was "Rip the tip, the banana slip."

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Chapter 9

Teaching Social Studies*

Curriculum Goals

The social studies curriculum, designed to strengthen observational and problem-solving skills, focuses on increasing children's understanding of their physical and social environment. A problem-solving approach is stressed, in which children examine how their behavior affects the environment and, conversely, how the environment affects them.

Structured social studies activities include three components: (1) the presentation of new information in organized units, (2) discussion, and (3) a concrete activity. Within these three segments, children study social processes, discover the relationships between structure and function, and examine cause and effect relationships.

New information is presented through books, pictures, flannel board presentations, and other media. The children begin the year with a study of their own lives, their homes, families, occupations, and the neighborhoods where they live. Later, children examine the origins of foods, farm and city life, transportation, and ecology. Throughout these units, children discover cause and effect relationships and make comparisons between their individual and collective experiences. The final series of units focuses on geography, mapmaking, and the study of other cultures. Children follow and chart maps, compare their individual cultural origins and examine a variety of lifestyles in other nations as well as their own.

As new information is presented, each child is encouraged to draw on their personal experience for relevant independent observations to contribute to discussion. Through sharing and discussion of these

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*This chapter is based on an outline and lesson plans prepared by Lisa Friedman.

observations, children draw conclusions about their relationships to others within school, as well as in the larger social environment. The discussion is guided to encourage children to listen to one another, to appreciate their differences and to become aware of the similarities shared by all. During discussion, an inductive process is stressed and logical progressions of thought developed through open ended questioning by the teacher. This aspect of the program remains fundamentally process oriented, where children often may determine the direction and content of discussion.

Following discussion, children participate in related activities which help them to apply the new information to their own lives and milieu. For example, after studying how weather affects the environment, children practice choosing appropriate clothes for each kind of weather. Older children might build model houses appropriate for different climactic conditions. This active application of information stresses responsible participation in, and manipulation of, the environment. Such activities provide great reinforcement for learning, as each child gains concrete understanding of what he or she has discovered in grouptime lessons.

The general goals of the social studies curriculum can be fostered throughout the preschool program. Activities and procedures described in the chapter "Planning for the Learning of Social Skills" can be considered part of the social studies curriculum. As children learn to interact with one another they develop an increasing awareness of themselves and their relationships with others. Disagreements concerning class procedure can be resolved by discussion and vote-taking, to accustom children to the processes of effective group dynamics. Dramatic play activities during which children take the roles of different family or community members reinforce the children's understanding of the functioning of community groups. Awareness of other cultures can be stimulated through the use of dress-up props, ethnic cooking experiences, and presentation of music from different cultures.

Field trips to community interest centers broaden the children's perspective. The impact of such trips can be enhanced by discussion and role-playing activities. For example, following a tour of the local post office, children were eager to set up their own classroom postal network, complete with stamps, letter carriers, mail sorters, and make-believe houses with addresses to facilitate delivery. Writing skills were encouraged as children created messages to be sent through the mail. Children not yet reading could send picture messages.

The following activities are a few of the projects which might be carried on in a social studies curriculum.

Sample Lesson Plans--Social Studies

Families: Children understand that there are many kinds of families; that family members care for one another; that each child is a member of a family; that there are families all over the world.

Equipment:

book about families, such as All Kinds of Families, by Norma Simon (Chicago: Albert Whitman, 1976)
pictures of adults and children of different ages, sexes, races (either children or teacher can cut these from magazines)
paper, paste, crayons

Procedure:

Read and discuss book about families. (If there is no book, the teacher might tell a story about a family, using flannel board pictures as visual aids.) Talk with children about their own families, how many people live at home or away, and so on. Discuss the varied roles family members might assume. Reinforce the idea that families come in many forms, and that the important thing about families is the feeling family members have for one another. Ask open-ended questions, such as "I wonder how many different kinds of families we can think of."

Have children make pictures of families, either by drawing or by pasting pictures of family members into a collage. Children may want to create their own family, or may want to put together different kinds of families. Encourage children to talk about the families they are making.

The teacher can write the children's words on their papers. Some children will invent stories about their families, which can be written down and read back.

Later, during another lesson children might form families of animals. Stories read about people in other cultures might stimulate further discussion about the varying roles of family members.

Houses: Children become aware of the different purposes of houses, and the different types of houses found in different places; children explore the factors which cause the difference--e.g., weather, transportation, natural resources, size of family, etc.

Equipment:

pictures of houses--either from books, from magazines, or drawn by teacher
collage materials for making houses--can use clay, pieces of wood, cloth, sawdust, paper, etc.
paper and pens

Procedure:

Present pictures of different kinds of houses, and discuss reasons for differences. Talk about the many different things people might do in a house, and write children's suggestions on a large sheet of paper. A cross-sectional picture of a house, showing different rooms, is helpful for this part of the discussion. Ask questions such as, "How many people do you think might live in this house? Where do they sleep? Are there places to keep things? What materials did they use to make the house? Where do you suppose they found these materials? Are other houses made of different things?" and so on.

Following discussion, provide children with materials to make their own houses. As they work, talk with them about what kinds of people might live in their house, what kind of protection from the weather do they need, where will they sleep and eat, and so on.

NOTE: Depending on the interests of the children, this lesson might span several sessions. In addition to creating houses of collage materials, children might want to build houses with blocks, either individually or working together to create one large house with different

rooms. Children might also use crayons or paint to make houses. Large cardboard boxes can be cut up and painted to be used as houses and so on.

Weather: Children understand relationships between season, weather, temperature, and clothing appropriate for different weather conditions.

Equipment:

flannel board, with figures that can be dressed in different types of clothing, and pictures of different types of weather
2 colors of construction paper, and paste
pictures of warm weather and cold weather clothes cut from magazines (either by children, or previously by teacher)

Procedure:

Open discussion by talking about the current weather conditions, and how children are dressed to meet them. Present the flannel board, and dress the figures for different types of weather. Ask children to guess which kind of weather each outfit would be most appropriate for. Have children cut out pictures of warm and cold weather clothes, and paste clothes for warm weather on one color construction paper, clothes for cold weather on the other color.

Ecology: Children understand what pollution means, and different ways it can be controlled; they begin to understand the effects of large populations on the environment (e.g., the environment becomes smoky, dirty, crowded, noisy, etc.).

Equipment:

pictures of clean, open spaces, and of crowded, dirty, city areas contaminated by pollution (these can be pictures from posters, books, or magazines).
long rolls of paper, pens, markers, colored chalk

Procedure:

Present pictures of polluted and unpolluted areas. Ask children to make comparisons, and discuss what might cause the differences. Discuss what a polluted city looks like--e.g., crowded, cars, trains, smoke stacks, smog--and what an unpolluted city looks like--e.g., grass, trees, blue water, parks, clean air, etc.

Divide children into groups, and have them make two murals--one of a polluted city, one of a clean city.

NOTE: An additional activity to reinforce the idea of controlling pollution is to organize a "clean up the yard" hunt. Have children collect all the trash which is polluting their own yard, and either make a collection, or glue it on to paper to make an "ecology collage." An introduction to this activity might be a story told with felt board pictures, about a boy or girl who neglects his/her environment--who leaves lights on, water running, trash lying around, etc. This child's parents might send him/her to live in his/her own house, where he/she soon runs out of all energy and is up to the ears in trash. The child then reforms, cleans up his/her space, and goes back to live with the family. The narrator can elaborate on this basic theme as seems appropriate.

Maps: Children begin to understand that a map forms a picture of where things are, and is a way of seeing spatial relationships between things we cannot directly look at. Eventually, children evolve a sense of place, and acquire the concept of living in a city, which is part of a state, which is part of a country, and so on. (This concept is a difficult one, and will not be completely understood for some time.)

Equipment:

paper and pens
globe and other maps

Procedure:

Present variety of maps and elicit what children already know about them. Talk about how things are placed on a map the same way that they exist in space. Have children participate in making a map of the room. Mark on the map the spot where you have previously hidden something special--perhaps the snack. Help children follow the map and discover the "treasure." (This game can also be played out of doors. Children might eventually hide their own "treasure," and make the map which leads to it.)

NOTE: In future lessons, continue to look at maps with children, and point out the location of different familiar places. Begin to discuss what different map symbols mean, and the meaning of the colors--e.g., blue usually represents water, brown or green represents the land, etc.

Interested children can pursue the nature of various geographical land formations. Point out the differences between islands and peninsulas. These concepts can be reinforced by encouraging children to form islands and peninsulas using sand and water, and then making maps of what they have created. Children can also form islands and peninsulas using blocks placed on large sheets of blue paper (to represent water).

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Chapter 10

Teaching Art*

Curriculum Goals

The study of art at the Child Development Preschool provides opportunities for children to develop skills of creative expression through an appreciation and utilization of art and design principles. The curriculum is process, rather than product, oriented. Children are encouraged to make creative use of a variety of art materials and to develop their skills of eye-hand coordination and fine motor control at their own pace, with positive support, understanding, and guidance from the teacher.

Children are guided in developing skill in working with a variety of media. Media available to children for use during each lesson include table painting, easel painting, watercolors, oil pastels, pastel resist, colored felt-tip pens, wide colored markers, collage materials, clay, finger painting, paper construction, pipe cleaners, wood scraps, and combinations invented by the children.

Discussions surrounding practical experience with art materials broaden children's use and understanding of the vocabulary of art and design--e.g., line, shape, color, pattern, texture, and the relationships among these elements. These artistic principles are presented by the teacher to provide a base of information to stimulate children's thought and creativity in their own work.

Freedom of expression and self-discovery are stressed in each lesson. Children's own work is not directed by the teacher, and the teacher does not complete children's projects for them. Through independent use of materials, children encounter unique problems of design.

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*This chapter is based on an outline and lesson plans prepared by Joy Menke.

The teacher's role is to encourage children to analyze their difficulties, invent possible solutions, test the possibilities and draw their own conclusions as to the most appropriate methods for solving the problem. As children gain experience in solving their own design difficulties, they acquire skills of analysis and evaluation which can enhance their aesthetic appreciation of many aspects of their environment.

The major goal of the art curriculum, then, is that children learn to think and express themselves creatively through their enjoyment of many different art experiences. The steps toward this goal involve the development of skills in the following areas:

Color

Identify, label, and match primary colors: red, yellow, blue
Identify, label, and match other colors: including orange, green, purple, white, brown, black, and grey
Understand how to mix primary colors to form secondary colors
Discriminate light and dark values of different colors
Sequence varying shades of each color

Line

Identify, label, and create rhythm (the repeated use of the same line)
Identify, label, and create the following lines--vertical, horizontal, curved, zig-zag, straight, wavy

Shape

Identify, label, and draw two dimensional shapes that have width and height--circle, square, rectangle, triangle, irregular shapes (other shapes can be included as children master these)
Identify and label three dimensional shapes, with understanding of width, height, depth--cube, sphere, rectangle, solid, pyramid, cone (advanced skill)

Texture

Understand that texture is the surface quality of things
Use the word "texture" in their vocabulary, and describe objects in terms of different textures
Identify and label different visual and tactile textures, such as rough, smooth, bumpy, fuzzy, etc.

Drawing Skills

Hold pencil in correct position
Draw inside a frame, around an inset, smooth freehand
Draw wide and narrow lines
Draw basic shapes freehand: circle, triangle, square, diamond

Glue

Use adequate amount of glue, enough to stick but not run down paper

Folding Paper

Put two edges of paper together with accuracy
Press folded edge down to form clear crease
Fold a sheet in half
Fold a sheet in half twice (quarters)

Scissors

Hold scissors in functional position (with thumb and first two fingers)
Cut paper
Cut on narrow line 1/8 inch
Cut paper continuously without losing scissor place
Shift hold on paper when cutting longer pieces

Handling Brushes

Press extra paint out of brush before applying it to paper
Wash brush in water to keep paint colors clear and clean

Cleaning Up

Wash self, manage water faucets, use towel and dispose properly
Take off apron and hang it up
Throw away scraps
Clean paint cups and brushes and put away
Put away materials and maintain neat art area

The goals of the art curriculum can be implemented in all areas of activity throughout the day. Teachers can encourage children to observe shapes and colors, designs and patterns in their clothes, in food, in natural objects, etc. Creative problem-solving can be encouraged in all areas, as teachers refrain from taking over when children ask for help, but rather guide them to discover their own solutions.

The basic format of small group art lessons includes reading books which lead to discovery of art principles (several are listed in the reference section), discussing the properties of line, shape, color, and form as they appear in the environment, and providing different media for creative expression. The exact content of each discussion will arise from the interests of the teacher and children, and from the available stimulus materials. Photographs, shells, wallpaper samples, carpet samples, seed pods, dried weeds, rocks, birds' nests, pine cones, leaves, the children's own clothes, and other materials can become a focus for discussion.

After discussing a particular concept, such as line, for example, the teacher might suggest that children use differe t media to form as many different types of lines as they can think of. The teacher can then discuss the different lines with each child, providing labels to increase each child's vocabulary.

The small-group activities suggested below are listed as suggested jumping off places.

Sample Lesson Plans--Art

Line: Children learn to create different types of line, and to notice repeated lines forming a pattern. Children increase skills with scissors and paper folding.

Equipment:

wallpaper samples
colored construction paper
scissors, glue

Procedure:

Present samples of wallpaper. Discuss different types of line and pattern, and reinforce idea that repeated lines and shapes form patterns. Present some abstract designs, and indicate that non-representational work can be labeled a "design," and is just as worthwhile as representations of objects. Compare similarities and differences in patterns.

Set paper and scissors out on table, and suggest that children fold paper in different ways to create lines. Suggest that they cut different types of lines--either by following the folds they have made, or by cutting in wavy or zig-zag patterns. Allow creative use of media to make collages or to enjoy the process of just folding and cutting. Talk about the different types of lines children are making.

Color awareness: Children discover that black can be made lighter by the addition of white, and white darkened by using black.

Equipment:

paint cups
white and black paint
paper
brushes
water

Procedure:

Have children pour a little white paint into their paint cup. Ask them to predict what will happen if they add black. Have them try adding some black, and painting with the result. Supply a cup of black paint, and ask what might happen when white is added. Have children add white, and test result. Encourage discussion, leading to generalization of the rule of value formation. Help children make a value scale, ordering colors formed from white to black. This lesson can be extended using different colors of paint and having children predict and test the effects of adding black or white to them.

Texture: Children understand that textures can be felt, not seen, while pattern and color are seen and not felt. Children are able to describe different textures using adjectives such as furry, bumpy, smooth, etc.

Equipment:

children's clothing
shells
other objects of different textures
textured collage materials and glue

Procedure:

Discuss clothes that children are wearing. Notice different colors and patterns (this lesson should follow others related to color and

pattern). Ask children to feel their clothes, and ask if different colors feel different, or if they just look different. Encourage children to describe different textures of their clothing--e.g., corduroy may be bumpy, wool is fuzzy, etc. Present other objects for feeling. If discussion needs more structure, have children sort objects into piles of similar texture.

Provide variety of collage materials of different textures. Encourage children to create collages combining different textures. Additional explorations into texture can be made using clay or play dough, and asking children to create different surfaces using forks, tongue depressors, etc.

Wood sculpture: Children discover possibilities in creating objects in three dimensional space.

Equipment:

small pieces of scrap wood
flat pieces of wood to serve as base for sculpture
Elmer's glue

Procedure:

Present material to children. Demonstrate and describe how glue can be added to hold wood pieces in a variety of formations. Encourage creative exploration. Children can create elaborate structures using this medium. If children have titles or stories to tell about their creations, write them down as they are dictated.

Pipe cleaners: Children experiment with the possibilities of using line in three-dimensional space.

Equipment:

large supply of pipe cleaners--preferably colored ones

Procedure:

Present pipe cleaners to children. Explain that they represent lines, and that just like lines drawn with pen or crayon they can be manipulated to form different shapes. Demonstrate how shapes can be

combined to form patterns and designs. Allow creative exploration of material. Children may want to make individual projects, or may begin to work together to create one large pipe cleaner sculpture. When this material was presented at the Child Development Preschool, children worked on a cooperative sculpture for several days, and labeled the enormous result the "Electric Christmas Tree Display."

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Appendix A

Workshop Report: A Program of Creative Dramatics for Intellectually Advanced Preschool Children by Claire Leary

Creative Dramatics is a form of drama for children. Through this art children discover how to improvise a story in movement and sound. This process can lead to individual creative expression, intellectual communication and social interaction.

The following pages describe this unit--a unit of Creative Dramatics designed for intellectually advanced preschool children. It discusses specific values that creative dramatics offers in a child's development. It proposes a model for a unit procedure which progressively develops a set of concepts and measurable objectives. Then it describes a procedure for developing each lesson.

In addition to the specific information on the unit and lesson procedures, the paper includes the use of creative dramatics in other areas of the curriculum. The final pages discuss problems encountered and possible solutions in a creative dramatics program for gifted preschoolers.

Value of Creative Dramatics

Creative dramatics is valuable in the preschool curriculum because it provides an opportunity for social, emotional, physical and intellectual expression by the individual as well as the group.

During the unit, the children learn many social interaction skills. They cooperate with others, share a common physical space, share ideas and take turns. They practice and discuss appropriate social role models. Many of the dramatizations involve relationships with others. These might include two brothers, a brother and a baby sister, two friends who live in the same house, a mother-father, a mother-father-child, a child and his favorite pet. The children talk softly to one another, touch and smile. During the climax they call excitedly to one

another, grab a hand and pile together for helping each other. After the structured drama sessions, the children easily group together during free play. They seem cooperative and integrated.

Many opportunities are provided for emotional expression. A child experiences a wide variety of emotional roles. The shy child can be powerful. The lonely child can be accepted and praised. The aggressive angry child can be gentle and loving. Children who continually play certain roles may be illustrating a stage in their emotional development. Some children continually play certain stock roles. It may be a helpless, dependent role; a sad role; a happy; helpful role; or a power role. A few children are not ready to play a role at all. During the year many children show a change in their role preferences. They begin to choose power roles or learn to channel inappropriate power roles into appropriate ones. Through role-playing, children can gain self understanding through identifying with others. At the same time, they can learn to take personal responsibility for their actions. They experience commitment to the group as well as personal competence. A skillful teacher can help a child develop emotionally by guiding him/her through certain material and encouraging him/her to play certain roles. As children practice positive social interaction behaviors and varied means of emotional expression, they become better able to use these skills outside the structured context of the drama lesson.

As creative dramatics encourages social and emotional growth, it also enhances the development of physical skills. The desire for expression through the body is strong in young children. Movement is a natural outlet for thinking and feeling. To provide the optimum conditions for large free movements, the teacher's greatest concern is with gross locomotor development. However, attention is also given to other areas. An understanding of the concepts of time, space, rhythm and body relationship is essential for the direction of physical expression. When children achieve proficiency and can integrate these areas, they gain mastery over their bodies. This is an important aid to all aspects of their growth.

Finally, creative dramatics stimulates intellectual development. The concentration-sensory areas teach the child to focus thoughts and discipline the mind. The demand for imagining environment, characters and events sharpens memory skills, evokes originality, fluency, flexibility and elaboration. It also develops association skills. Each lesson presents decisions to be made and problems to solve.

The Unit

The model unit presented here develops a set of concepts and measurable objectives to accomplish these social, emotional, physical and intellectual goals. These concepts and objectives have been derived from an integration of the ideas of Brian Way (1967), Geraldine Siks (1977), Gladys Andrews (1954), and others in the fields of creative dramatics and creative movement. The overall procedure of the unit and specific lesson plans result from a refinement of a year-long course that was successful with gifted preschoolers at the Child Development Preschool at the University of Washington.

The six areas developed in this unit are as follows:

1. Concentration
2. Imagination
3. The physical self
4. Speaking
5. Emotion
6. Intellect

In the early stages of the unit, one area is introduced at a time. In the later stages, the lesson may emphasize one particular area, but most of the others are being developed simultaneously since skills have been accumulated from the previous lessons.

The unit has five sections:

1. Concentration-Senses
2. Creative Movement
3. Characterization
4. Story Theatre
5. Playmaking

The Concentration-Senses section developes the areas of concentration and imagination. The Creative Movement section develops the physical self.

Characterization focuses on the development of speaking and emotion. The fourth section, Story Theatre, and the fifth section, Playmaking, integrate all six of the areas, but focus in particular on the intellect.

The five sections of the unit can be divided into two main parts. In the first four sections children are players. They participate in introductory exercises for building concentration and imagination, learn to create an environment and a character, listen to directions, and offer ideas, speech and movement. The children pantomime images, poems and short stories with physical interaction while the teacher narrates. The teacher guides the children through the exercises, and later on in the unit through the stories. The teacher uses ideas offered by the child, but essentially she/he controls the play.

In the second part of the unit, Playmaking, the children are playmakers. Children assume responsibility for the play. They plan the situation, the characters, and the action from literature or from their own original images. The play has form: a logical beginning, a climax and a logical ending.

Many exercises for these five sections of the unit are suggested in either the preschool books or books specific to movement and creative dramatics as listed in the bibliography. They should be selected according to the teacher's interests and to their relevance to a particular theme being explored by the class.

Each section listed above has a set of measurable objectives which occurs in the lessons. The objectives induce behaviors that can be observed by the teacher.

In the Concentration-Senses section, the child should demonstrate the following measurable objectives:

1. Concentrate attention on the task.
2. Show relaxation in muscles.
3. Show relaxation through creating images.
4. Show trust in self and others.
5. Show awareness of senses: hearing, looking, smelling, tasting, touching.
6. Show use of sensory awareness in creating images.
7. Show use of sensory recall for creating images.

The end goal of creative dramatics is the improvisation of a story. Children need to be able to concentrate to focus their thought, to control their bodies and to interact with others. Creating images requires concentration. It also takes trust to risk sharing an image non-verbally and verbally with another. This mutual trust builds confidence. The sensory training helps children to relax and concentrate so that they use their imagination to believe, improvise and respond to the images of others.

In the second section of the unit on Creative Movement, the emphasis shifts to the development of physical skills. The measurable objectives for this section are as follows:

Non-Locomotor Movement

1. Show an awareness of body parts.
2. Show an awareness of body space: shape the body into round, crooked, straight, twisted, bent, swinging and stretched forms; use the space around the non-locomotor body--the levels, the range.
3. Show awareness of body force: light-heavy, firm-loose, bounded-flowing.
4. Show body control: move from stillness to non-locomotor movement to stillness.
5. Show body relationship: form a group shape touching other bodies in pairs, threes and large groups.

Locomotor Movement

1. Show variety of foot patterns: walking, running, jumping, hopping, galloping, leaping.
2. Show combination foot patterns: sliding, skipping, turning, spinning.
3. Show a movement phrase in combinations of 2, 3, 4, or 5: run, jump, run, fall, roll.
4. Show awareness of body traveling through space: direction, level, range, focus (traveling in round, straight, crooked floor patterns, traveling high and low, near and far, moving around the space another body or imaginary object occupies).
5. Show body control: stillness to traveling to stillness.
6. Show body relationship: traveling in pairs, threes, and groups.

Rhythm in Movement and Musical Instruments

1. Show awareness of time: fast-slow, interrupted-sustained.
2. Show awareness of accent, beat, intensity.
3. Show a rhythmic pattern.
4. Show a repeated rhythmic pattern.
5. Show ability to lead others in rhythmic activities.

Proficiency in the above skills provides the foundation for creative rhythm. The child's sense of awareness is further increased, thereby building on the first section's exercises in concentration and the senses. He/she can express different emotional states with his/her body. A child with hesitant light physical patterns experiences assertive strong movement. A child with fast aggressive physical patterns experiences slow sensitive light movements. A child can now "physicalize" objects, people and events. His/her body becomes a powerful learning tool. He/she can gain a wide variety of information on many subjects by feeling it with his/her body. He/she learns that words, colors and things have rhythm.

Eventually an atmosphere exists in the classroom that fosters free, interpretive, independent movement. The children have been introduced to the skills. Now they need a few more additions to use those skills freely. They need good rhythmic music (examples are listed in the appendix). The children should have ready access to a record player for listening to this music on their own. They also need a good selection of rhythm instruments, either bought commercially or homemade (Andrews, 1954). These should be introduced a few at a time. The teacher discusses the instruments, demonstrates possible ways to play them and allows the children to explore their elements freely. Instruments can provide a good outside control for the teacher to use, and can serve as motivating stimulus for creating movement.

Another aid to encourage free independent movement is the periodic introduction of materials that the children can explore while moving, such as hoops, streamers and scarves. Sometime the environment of the room can become the stimulus for movement. For example, a maze might be created, with string or objects the children can move through and around.

Through these activities children become ready to use skillful rhythmic body movements in the portrayal of a character.

The section on characterization has the following measurable objectives:

1. Show use of body parts when creating the character.
2. Show locomotor movement combinations appropriate to the character.
3. Show actions of the character: eating, putting his clothes on, occupational activities, etc. Show the purpose.
4. Show sounds of the character.
5. Offer ideas for a character.
6. Tell who the character is.
7. Tell what the character is doing through monologuing and dialoguing.
8. Show emotional quality of the character.
9. Show flexibility in chosen roles.

The above objectives bring together the previously learned skills of concentration, sensory awareness, imagination, and body movement. Now the emphasis is on speaking and emotion. The children form a mental picture of people, animals or things not present and bring them to life. The teacher can directly observe their conception of these characters. In the early stages this is apparent in outer appearance only.

In the later stages of characterization, as skill is gained, the children develop an ability to assume the emotions of these characters. As they learn to choose different kinds of roles, they gain perspective on others.

Language occurs before, during and after the lesson. The children communicate informally with the teacher and their peers when they plan. During the performance they speak for their character and dialogue with other characters. After the characterization study is performed, the children participate informally in discussions. The measurable objectives for the day are reviewed and those that were accomplished are positively reinforced.

After basic characterization is mastered, costumes and props can be introduced as added stimuli. Children create many interesting character effects with swatches of material and clothespins. Special hats and props not usually available in the room can be brought out for the characterization lessons.

The principles learned in the above section can be extended to puppets. Puppets can be made by the children or the teacher, or can be a commercial product. Characters are created. Puppets appear from behind an improvised stage and tell who they are, what they wear, what they eat, what work they do and why they are performing their actions. This gives further practice in language and forms a base for the next section in story theatre.

In Story Theatre, the teacher narrates a story from literature. The children play whatever part they desire, fading in and out of characterizations of people and environments as the story progresses. They learn to maintain their concentration throughout the stories which proceed from short to long. They learn that the story has a form: a beginning, a climax, and an end.

Before the story begins, the children offer ideas for the people and environment. The vocabulary used is: Who is in the story? Where should this action happen in the room? What Happens in the story? The emphasis for story theatre is on the intellect although all six concepts are now integrated.

The measurable objectives for Story Theatre are as follows:

1. Offer ideas for characterization and environment.
2. Offer original ideas for a new character, for dialogue and body movement.
3. Show decision-making ability verbally and non-verbally.
4. Follow logical sequence of the story.
5. Show ability to integrate the variety of elements in the playing of the story:
   a. Non-verbal and verbal interaction of their own character with others.
   b. Integration of original ideas into the story.
   c. The transition from one scene to another.
   d. The addition of added stimuli: costumes, props, scenery, instruments, music, lights.
6. Show flexibility in changing characters and environments as story progresses.
7. Show ability to tell a story.
8. Show an increase in languaging: monologuing, dialoguing, preplanning and post discussion.
9. Show an increase in independent self-organized movement activities.
10. Show an increase in independent playing of stories.

The children must use their intellect to offer their ideas, to create original ideas to add to the story, to solve the problems of who and what they will be, and to decide how to create the physical place for the action. They must follow the logical sequence of the story and integrate many elements.

Through the example of the teacher, a few of the children will be ready to take over the role of the narrator in the later stage of this section. They tell the story while the rest of the children act out the story. Many of the children will be offering dialogue and appropriate physical movement. The verbal expressiveness introduced in the characterization section is extended in this section. The children learn to establish the character and the setting, and to move the action through what they say. The teacher uses cues such as "Let's listen to hear what they are saying," or "And the man said," to elicit dialogue during the narration. When the story is finished, the children may repeat the playing of the story with everyone switching roles. After the play, the teacher guides the children in a discussion of the measurable objectives. The theme of the story is discussed. The children are positively reinforced for their accomplishments.

Special effects are ready to be added to the plays as the players gain story theatre skill. These are introduced with one or two and become more complicated in the later phase of longer stories. Some of the children may choose to be in charge of musical instruments during particular plays. Costumes, props, scenery, rhythm instruments, recorded music and lighting effects may all be effectively integrated. These concrete aids motivate the children and help reduce inhibition by taking children's attention away from themselves.

During this section, the puppetry goals can be broadened to playing stories the children have already acted out. This gives them further practice with story form and dialogue. They can also form self-directed story groups that re-play stories done in previous lessons. The teacher sets out the book or other stimuli used in the story theatre lesson, the record or musical instruments used, and flannel board pieces of the

characters. This circle of objects draws three or four children together who play the story through during free play without teacher assistance. The many stories presented in a variety of ways in the story theatre section increase an appreciation of books and an interest in reading for children.

At the end of the story theatre section, the teacher and children begin to create original fantasies together from various motivational devices, e.g., looking at pictures, wearing costumes, listening to sound effects. The children become ready to create their own original stories with form.

The Playmaking section is the final phase of Creative Dramatics. The emphasis is again on the intellect although, as in story theatre, all six areas are now integrated. The intellectual tasks of playmaking are more difficult than those for story theatre. The children are now self-directed and the teacher becomes a guide. The focus is on building form in a story. All of the plays have original integrated content. Some are stories from literature with integrated original episodes. Others are completely original.

The measurable objectives for Playmaking are:

1. Offer ideas for a story from stimuli presented to the group.
2. Offer ideas that form a logical sequence from original ideas presented by the group.
3. Offer ideas that build the sequence to a climax.
4. Offer ideas that draw the sequence to a resolved conclusion.
5. Show ability to follow the integrated ideas of the group through body movement and dialogue during the playing.
6. Show ability to begin the activity without teacher assistance.
7. Show ability to build action and movement to a climax without teacher assistance, during the playing.
8. Show ability to conclude action in an integrated form without teacher assistance, during the playing.
9. Show further increase in languaging: monologuing, dialoguing, preplanning and post discussion.
10. Show ability to organize in a group.
11. Show ability to cooperate in a group.

The children learn how to integrate diverse ideas into a cohesive whole. They move from dramatic play (without form) to playmaking. The problem solving is more difficult because of the amateur nature of the

material suggested by the children. They have to work very hard to figure out how to connect all of the ideas presented and to make something interesting happen. In the beginning they only try to make one thing happen. Later in the section, they can make more than one thing happen. They learn how to focus on one event at a time.

Verbal skills, cooperation and good ideas are essential to self-planning in the small groups. The teacher assists in helping small groups of two or three plan small original pieces they can show to each other. In the beginning of the section, the teacher may also introduce the stories, interject transition sentences, and conclude the story. Later a child will take over this function.

Children vary in their response to this self-directed activity. A child may often be good at one skill and show weakness in another. A very verbal child with excellent ideas may need to develop skills in working cooperatively in a group. A child may be non-verbal and in the planning section may offer few if any ideas. During the playing this same child may have the ability to show non-verbally how to begin the play. This child may not offer dialogue, but may instruct others about what to do at crucial moments, like the climax or the end.

The verbal activities of the Playmaking stage are further extended. The communication in the planning stage is different. In Story Theatre, the teacher still basically organized the brainstorming results. Now the children organize their own ideas. Another difference is that now the stories are original. These stories can be typed on large child typewriters on a ditto. Each child who helped make up the story can have a copy. A copy is kept in a large story scrapbook. The children can make illustrations of either the characters or the sequence of events in three frames. Those children who can read can look at this independently. The teacher can read these stories to all of the children from time to time.

A few of the children can now create their own stories with form. Children can tell their stories into a tape recorder for later transcription. These stories can be added to the storybook collection.

Storykits can be assembled for these original stories for independent use during free play. The scrapbook can be set out, the children can make and cut out the characters and select musical accompaniment from instruments or records, costumes and rostrums for scenery. Since they have already played the story in a playmaking lesson, they will know the story and the procedure.

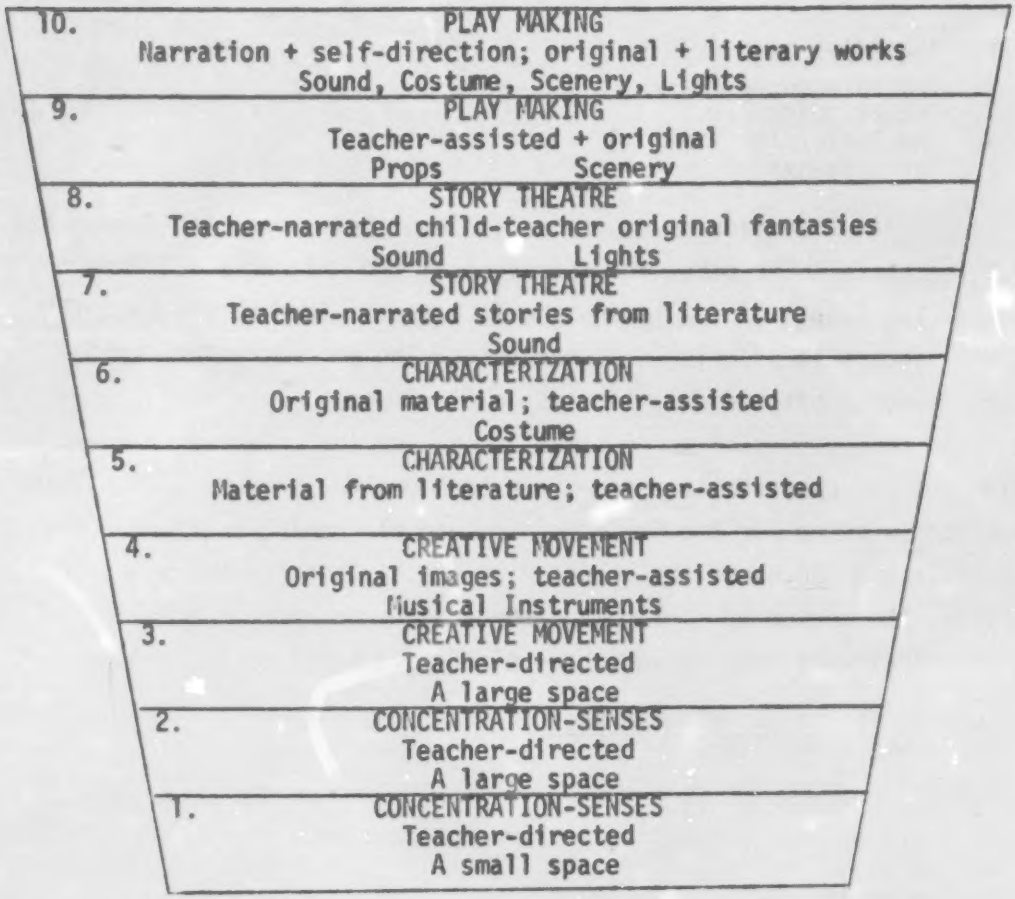
Puppetry can now also include the playing of the original stories. The children can sometimes make the puppets, or the teacher may sometimes make them. Commercial puppets can have an original story built around them.

These kinds of reinforcements build confidence in oral and written expression.

Each section of the unit described above can be expanded to adapt to the amount of time a teacher wants to include creative dramatics in the curriculum. Children may master the objectives of each section at different rates. A teacher may, for example, spend more time on Concentration-Senses with one group than with another.

The following chart illustrates a feasible 10 week program:

A TEN WEEK UNIT PROGRESSION FOR A CREATIVE DRAMATICS PROGRAM



The Lesson

The lessons follow a basic pattern. There are five parts to a lesson:

1. The Beginning Activity
2. The Warm-up Activity
3. The Planning Time
4. The Performing Time
5. The Evaluation

In the first section on Concentration and the Senses, the lesson has only three parts. The other four sections of the unit have all five part lessons. The length of the lesson should be determined by the material that the teacher is offering from the unit. The Concentration-Senses section could be offered daily for 15 to 20 minutes. This could change to a 30-35 minute session three times a week for the Creative Movement section and for Characterization. Then this could change to a 45 minute to one hour session for the Story Theatre and Playmaking sections. This again would have to be set up around each teacher's preferences. Generally, the beginning sections of the unit use a shorter time period than the final sections. A suggested time chart might be as follows:

Section 1--Concentration-Senses
15-20 minute session

1. Beginning Activity	5-10 min.
2. Warm-up (concentration/creative movement exercises)	10 min.
3. No planning	
4. No performing	
5. Evaluation of the measurable objectives from concentration-senses/creative movement	5 min.

Section 2--Creative Movement
30-35 minute session

1. Beginning Activity	5-10 min.
2. Warm-up (creative movement exercises)	10 min.
3. Planning by teacher	5 min.
4. Performing (a movement study)	10 min.
5. Evaluation of the measurable objectives from creative movement unit section	5 min.

Section 3--Characterization
30-35 minute session

1. Beginning Activity	5-10 min.
2. Warm-up (creative movement/characterization exercises)	10 min.
3. Planning by teacher and child	5 min.
4. Performing (character study)	10 min.
5. Evaluation of the measurable objectives from creative movement and characterization unit section	5 min.

Section 4--Story Theatre
45 minute session

1. Beginning Activity	10 min.
2. Warm-up (creative movement/characterization exercises)	10 min.
3. Planning by teacher and child	5-10 min.
4. Performing (playing of a story)	15 min.
5. Evaluation of the measurable objectives from creative movement and characterization and story theatre unit sections	5 min.

Section 5--Playmaking
60 minute session

1. Beginning Activity	15 min.
2. Warm-up (creative movement/characterization exercises)	10 min.
3. Planning by child; teacher guides groups	5-10 min.
4. Performing (playing of the original story)	15 min.
5. Evaluation of the measurable objectives from creative movement and characterization and story theatre and playmaking unit sections	10 min.

On the following page a chart is given to illustrate the content of these five parts of the lesson.

THE LESSON

Five Sections of the Unit	1. Beginning Activity	2. Warm-Up	3. Planning	4. Performing	5. Evaluation
1. Concentration-Senses	a. Read or tell a story from literature. b. Examine visual aids. c. Discuss theme and children's personal experiences. d. Present other stimuli necessary for exercises.	Introduce exercise on concentration or senses (see bibliography). Choose measurable objective desired from those listed in Unit plan. As skill increases, enlarge space.			Children evaluate the measurable objectives during snack through questioning by teacher. Positive reinforcement is given. Teacher records skills which were or were not demonstrated as well as any interesting additional behavior noticed.
2. Creative Movement	a.) b.)Same as above. c.) d. Advanced lesson introduces musical instruments.	Introduce specific functional exercises in early stages. Choose specific measurable objectives desired from unit section on creative movement. Advanced lessons move to complicated skills. Use rhythm instruments and recorded music.	Teacher-directed. Discussion of who will perform what movement and action. Advanced lessons--children offer original ideas used by teacher and select own movements.	Perform a movement piece from imagery to music built on the warm-up exercises. Teacher narrates.	

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THE LESSON (cont'd.)

Five Sections of the Unit	1. Beginning Activity	2. Warm-Up	3. Planning	4. Performing	5. Evaluation
3. Characterization	a.) b.)Same as above. c.) d. Advanced lesson introduces costumes, props.	Introduce exercises in characterization (see bibliography). Choose measurable objectives from those listed in unit section on characterization.	Teacher-directed in beginning. Discussion of who will have certain parts. Give suggestions for actions. Advanced lessons-the children select own character and offer original actions. They plan in small groups.	Perform a character study alone, in pairs, in a group. Can use music, costumes, make up. Teacher can video-tape and photograph. Teacher narrates.	Same as above.
4. Story Theatre	a. Tell a story (see appendix). In advanced lessons children tell story. Children help to tell by using flannel board pieces and offering dialogue. b. Show pictures. c. Discuss theme. d. Advanced lesson introduces scenery.	Combine measurable objectives from creative movement and characterization. Adapt the desired objectives to suit the story.	Teacher assists children in clarifying who, where and what happens. Teacher and children suggest possible dialogue and how to integrate new ideas added to the story.	Play the story through 2 or 3 times. Children can play any part. More than 1 child can play a role. Children can switch roles. Special effects are added.	Same as above.

THE LESSON (cont'd.)

Five Sections of the Unit	1. Beginning Activity	2. Warm-Up	3. Planning	4. Performing	5. Evaluation
5. Playmaking	a. Children make up story from various stimuli. b. Teacher discusses theme. c. All discuss special effects added to play: music, props, scenery, costumes.	Same as above with more emphasis on language objectives.	Children plan the who, where and what will happen in small self-directed groups of 3. Teacher guides the group to keep form in the story.	Children begin original story, build to a climax and end. They use the movement and character warm-up exercises in their play. Special effects are added. Longer stories can be played. Original episodes may be integrated with stories from literature.	Same as above.

Each of the lessons described above should have approximately 4 or 5 measurable objectives. The early lessons emphasize objectives from one section. As skills are accumulated, the later lessons include objectives from 3 or 4 of the sections with the focus on the section being studied.

After the lesson is over the free play of the children is observed and the teacher records any carry-over activities from the creative dramatics session.

Problems Encountered in Using Creative Dramatics With Gifted Preschoolers

The material available for teachers of gifted children ages 3 to 5 years falls into two categories. One source is from preschool books for teachers. These books offer sections on rhythm, drama and movement. Most of this material is valuable for use in the early stages of the unit described in this paper. However, few offer any progression. They are isolated exercises presented laterally. They stop at the early stages of Story Theatre. Form is not presented, dialogue is de-emphasized, planning is teacher-directed, and playmaking is not attempted. All of the lessons are very short. Children are not challenged to extend their attention, their verbal skills or their intellect. There seems to be an assumption that preschoolers cannot handle Story Theatre and Playmaking. This is not a correct assumption for gifted children and it may not be correct for a class of regular preschoolers. There are often gifted children in a regular preschool class and one or two children can often carry the more advanced demands of the later lessons while others can participate at a less intellectual level. This kind of class satisfies individual needs as well as providing a more satisfying group experience with extensive applications to other areas of the school curriculum.

A better source for teachers is the collection of books in the field of creative dramatics and creative movement as listed in the bibliography. The problem with this material is that these books were written for older children. The literature and procedures suggested need to be adapted to younger children.

In the area of literature for children, many books recommended for older children contain aggressive characters and conflicts. The pre-school child often confuses fantasy with reality. This aggressive material frightens many of the children. Role playing makes the content even more fearful than having an adult read it. This can cause a child to withdraw altogether from the drama session.

In addition, research has demonstrated that children who act out aggressive content carry over aggression into other times of the day--free play, the playground, lunch, snack and transitions (Caldwell, 1977; Caldwell & Ricciuti, 1973; Roedell, Slaby, & Robinson, 1977).

For these reasons, the teacher should screen material for aggressive content and select material that presents appropriate role models and offers positive experiences. The appendix lists some suitable stories. Many of the aggressive stories can still be used if the teacher is skillful at editing the material.

Another problem with the suggested literature for older children is that they are often too long. These stories must be shortened to fit the shorter attention span of preschool children. However, gifted children can understand more complicated stories than regular pre-schoolers. For example, some three or four year old children may be reading fourth grade books. The teacher must be skillful at making the story shorter without necessarily making it more simple. While gifted children can intellectually absorb the length of the story, their bodies still have a short physical attention span. Beginning stories should have just one event happen. During playmaking the children can build up the length to two episodes. The longest stories can be played during story theatre when the teacher's narration can hold the child's attention to its limit. She/He can control the story's length in accordance with their attention span. The teacher needs to collect a repertoire of short stories that have interesting characters, strong action and provide a quality experience. Such a list would be a useful addition to preschool literature.

The second area of concern to teachers is that of expectations from preschoolers in creative dramatics. Because of the age difference, the procedures for older children are different and more limited results are to be expected in some areas.

Due to the shortened attention span, the time for the lesson progresses from 15 minutes to an hour rather than starting with an entire hour as recommended for older children. Another difference is in the planning period. In the early stages the emphasis should be on sensory-motor planning activities rather than on discussions on what will take place. For example, the children immediately become an animal and move to their places of habitat rather than talking about this. In the Play-making section, the children will show much less self-planning ability than the older children. They may develop the character, conflict and conclusion in one minute's conversation in a paired grouping. One such conflict developed at the Child Development Preschool was this: a lady was walking down the street; a cat came by and scratched her on the leg. The children have created characters, but they need teacher guidance for clear ideas of the lady and the cat and they need to practice these characters. Then they need to work out a resolved conclusion and practice the whole scene. This planning will finally take 5 minutes instead of 1, and children will be ready to show it to others or join the episode with another for the playing. Older children would create a more fully developed story.

In the performance part of the lesson, the teacher can expect less dialogue from younger children. One or two children may be fairly fluent, but often they talk to characters who only say one word in return. There is little flow. If the timing is too slow, the teacher can assist by filling in phrases such as "I wonder what that person will do now?" If no action or dialogue comes, the teacher can fill in the reply or actually enter the scene as another character and enter the conversation. This must be done simply and quickly to sustain an integrated play.

In the area of characterization, the preschooler will develop outer appearances, but not much emotional quality as compared to older children.

During the evaluation, younger children offer less analysis. They are tired. The teacher points out the measurable objectives informally during snack, and praises all goals accomplished. Many of the children are not really aware that they are doing an evaluation. The teacher encourages them to reinforce one another for specific tasks accomplished.

In presenting Creative Dramatics to preschool children, however, teachers should not limit their expectations of what children can accomplish. Teachers should proceed through the entire unit. It may be that only a few children will move into playmaking, but all should be given the opportunity since this is the most exciting phase of the unit. It will be a real challenge to their concentration and their intellect. The verbal expressiveness that will occur is often beautiful. The overlapping of children's fantasy and reality will produce vivid original imagery. Their imagination will be rich. It is fascinating to see and hear their conception of the world. Many preschoolers will explore creative movement in a less inhibited way than older children. Most rewarding will be their emotional development. While they may not be able to fully express an imaginary character's emotions, they often express real emotions of affection toward the teacher and their peers in dramatic moments of love, safety and harmony. The fantasy-reality confusion permits a mother rabbit to really love the child who is the child rabbit during the story. When these moments can be made to occur for needy children, the teacher has a powerful tool for aiding emotional growth.

Drama and Other Areas of the Curriculum

Drama can augment skills taught in other curriculum areas. The other areas can also reinforce the skills taught in drama.

In drama the section of the unit on Concentration and the Senses explores sensory exercises that are helpful to the goals of sense experiments often conducted in the science program.

The Creative Movement section aids several fields. The areas of language arts and math are helped by the exercises on body part awareness, which strengthens the small muscles used in writing. The exercises in body shape allow children to demonstrate with their bodies the concepts of the circle, triangle and square that are used in pre-reading, math and art. Body space exercises give concrete experience in abstract words such as up-down, in-out, near-far, through-around and between that are used in language arts, math and three-dimensional projects in art. Body effort exercises offer physical expression for words that tap emotions. Similar words used in art can be expressed in color. Creative movement also aids social studies by giving opportunities for emotional expression and the practice of social skills. The locomotor foot patterns can give physical experiences in counting useful for math. Practice in body control and grouping of children assists all areas in group organization.

The Story Theatre section can support the reading program if the drama and reading teachers together compile a list of some of the same stories to use. The children would be motivated to try to read a book or original story they had played in drama and the opposite would be true as well.

In Playmaking, concepts used in math can also be used to plan an original story in the area of sets. If a similar vocabulary is used in math and drama, the children can draw the connections. Sets, sub-sets and interlocking sets can be illustrated through the establishment of environments, characters and conflicts. In addition, children's key words collected in the reading program can be used in developing original stories.

In general, all areas can benefit from a list of vocabulary words that the teachers can use to present common concepts. Such a list might include the following: prediction; set, sub-set, interlocking set; round, jagged, straight lines; loose, firm, heavy, light, fast, slow, flowing, interrupted force; who, where, what happened, beginning, climax, end; sad, happy, angry, peaceful feelings.

Drama skills can be emphasized at times other than the structured lesson. During free play, games which emphasize body part awareness such as "Simon Says" or "Did You Ever See a Lassie" can be encouraged along with those which emphasize body control such as "Red Light."

On the playground, teachers might encourage activities using locomotor skills such as hopping, jumping, running, skipping, etc. observing the children's skill at these activities. If someone shows a need for development in a particular skill, this help might be provided during a creative movement warm-up.

In the classroom, the area of dramatic play can be amplified. Dramatic kits can be assembled around special areas such as "doctor," "store," "restaurant," "the city," or "camping." Discussions with the children, addition of new props, new placement of materials and the encouragement of role-playing provide more form and better speaking opportunities, and motivate new ideas and group cohesion.

The scrapbook of original stories can be used as reading material for the children. When they are working on the alphabet shapes, the children can experience the shape with their bodies. Similar vocabulary can be used whenever a story is discussed, e.g., who is in the story? Where does it take place? What happens in the story? Which part is the beginning? the climax? the end? This would aid comprehension and reinforce the form of original stories.

In math, when distances are being measured, the children can use their bodies. They can count by using various locomotor skills learned. When adding and subtracting, they can use group skills from drama if groups of children are used as the items. Grouping can be also reinforced by all the areas if children are often selected by colors they wear or by alphabetizing their names.

In a coordinated program, some of these skills could be introduced at the same time in all areas. Some are beginning-of-the-year skills, such as concentration, and some occur later in the year. For example, a coordination of sensory and body part awareness might occur between drama and science early in the year. A coordination of organizational skills common to math, drama and art might occur later in the year.

Common themes could also be part of the program. An effective program combines occasional coordinated skill development plans and occasional coordinated thematic plans. The teachers of different areas know what skill objectives they have in common and can reinforce each other. The thematic plan reinforces content information and builds a group spirit among children and teachers.

Conclusion

This report has described a creative dramatics program. The concepts and measurable objectives give an overall guide to the unit and the lessons. The progression of the unit develops skills necessary to challenging and exciting story drama. The lesson procedure builds each class to a satisfying whole. The bibliography offers valuable basic material for older children. The suggestions for adapting this material for gifted and non-gifted preschoolers should make it suitable.

Sample Lesson Plans--Drama

1. Concentration-Senses "Sound"

To develop attention on a task
To develop awareness of sound
To develop physical movement

Equipment:

Book on sounds: I Hear, by Lucille Ogle and Tina Thoburn (American Heritage Press, 1971)
Four boxes from small to large with an elastic stretched around open end
Four glasses from small to large with a spoon for striking
Six drums--3 different kinds
One large box with hole in one end entitled "Sound Box"
Record: "Jungle Beat"--Subri Moulin Equatorial Rhythm Group
Picture of African tribal dance

Procedure:

1. Show picture book I Hear. Ask children to make sounds for the pictures in the book. Show about 10 pictures. Make point that things make sound. Ask question: "What do you hear now?" Children close eyes and listen.

2. Children go on a "Sound Walk." Children sit in hall and listen, "What do you hear in the hall?" Children go upstairs, "What do you hear in this place?" Children go outside, "What do you hear outside?"

3. Children return to rug. Make point that they can make their own sounds with things. First pass out the sound boxes, then the glasses and spoon, and then the drums. Children explore these different sounds.

4. Make point that they can make sounds with their bodies. Discuss people who dance using bodies and instruments for sound as they dance. Show pictures of African tribal dances. Teacher suggests that they find their own space in the open space of the room. Ask how they can make sound with their hands? feet? voice? mouth? knees? Put on African record. Have children freely explore dancing and music in open area of room.

5. During snack: Improvise an "African grass hut" in one corner with paper, poles, etc. Children eat snack in African grass hut. Show pictures of Africans dancing and using instruments. Suggest the African hut with dancing, singing, hunting and eating as a special activity they can choose during free play. Also show the Sound Box. Suggest that objects that make sound are in the room. If they discover an object that makes a sound they can put it in the sound box during free play.

2. Creative Movement--"Color Poems"

To develop non-locomotor, locomotor and rhythmic movement skills
To develop awareness of body space: the shape of the body in space and the use of the space surrounding the body
To develop awareness of body force
To develop body control
To develop imagination
To develop the senses
To develop ability to create a poem

Equipment:

Tape recorder
Overhead projector, food coloring (5 different colors), water, glass dish, stick, bubble solution of dish detergent and water and a blower
Record: "Daphnis and Chloe"--Ravel
Index cards, magic marker
Book: Wishes, Lies and Dreams, by Kenneth Koch (New York: Chelsea House, 1970), pp. 1-53, especially p. 19

Percussion instruments
Drawing paper, crayons and several records of music which suggests different moods

Procedure:

1. Clap hands. Ask: What color is that? What color is "pop"? "1"? "a"? Say that these are color poems. Read one line poems: "A clink is a drink of pink water (Koch, p. 10). "Yellow, yellow, yellow. The sky is yellow" (p. 19). "One of the saddest things are that these are colors . . . " (p. 17).

2. Suggest that children make some color poems. Make point that colors suggest pictures that help to make a poem. Describe a method of reflecting colors on a wall. Suggest that the children experiment with the method. Demonstrate. Plug in the overhead projector in a darkened area. Fill a flat glass dish with one inch of water. Cover the overhead projector with a sheet of acetate to protect the glass over the reflecting light. Place the water dish over the acetate sheet. Drop a color from food coloring container into the water. The children look at the reflected image on the wall. Teacher suggests that the colors might remind them of wishes, of dreams, of noises, of things they've seen, of feelings. Ask question: "What can you say about this color picture?" Write the images down on a large index card with black magic marker as they are offered. Interpose questions to facilitate further images.

3. Suggest that the children find their own space on the floor area in front of the projected swirling color. Play the record "Daphnis and Chloe" and using their images do a narration of the color poem. The children interpret the poem in movement. The teacher makes the point that the children can create these images by changing their body shape and by using the space all around them just as the color does on the wall in front of them. They begin by having their body become the color flowing in the water. Then the narration of their poem begins and they change shape, force and space according to the image. The teacher cues the children for in-depth exploration by indirectly inciting certain children who offer excellent interpretation--e.g., "Mary's color is turning and rolling very low down. Now Jack's explosion jumps high, his arms, his legs, his head are jumping high and suddenly it falls silent! His body still shows the glowing red." The teacher uses percussion instruments over the music for images needing forceful sounds--e.g., "Red is an explosion!"

4. Repeat. Each child has a turn making the color picture.

5. At the end do a clear water picture: still, rippling and agitated.

6. During snack: Teacher comments positively about the children's poetic imagery. Ask what their favorite image was; their favorite color. Suggest that they might want to illustrate a color poem with paper and crayons during free play. They can choose music and tape their own poem as they work. They can type their poems. Teacher can write down the words they want to use and they can copy them.

RESULTS OF LIGHT SHOW

Poems

"A PRETTY PICTURE"

O-R-A-N-G-I-S-H
R-E-D
Y-E-L-L-O-W
It looks like . . .
Blood,
Santa Claus,
A lollipop melting
A pretty red,
A horses head,
A C-O-L-O-R T-R-E-E

"IT'S DARK"

It's dark,
In the night,
With a Sea Monster,
A turtle,
DARK NIGHT

"A POEM ABOUT WATER"

W-A-T-E-R F-O-U-N-T-A-I-N
B-U-B-B-L-E-S
A Swimming Pool,
With bubbles coming up.
S-O-M-E-O-N-E S-W-I-M-M-I-N-G
A Sea Diver swimming under water.

3. Characterization

To develop physical movement when creating characters: locomotor combinations, e.g., run, fall, roll; non-locomotor, e.g., use of space body parts and effort
To develop ability to offer ideas for a character
To develop ability to monologue and dialogue as a character
To develop the emotional quality of a character
To develop flexibility in chosen roles

Equipment:

Book/record album "A Little Duck," Dance-a-Story, by Anne Barlin and Paul Barlin (New York: Ginn & Co., 1964)
Flannel board; flannel forms for duck, egg, pond, wave, log, ship, a bird, house
Streamer, 21 feet long; tape
2' x 4' blocks
Wrist bell, 2 rhythm sticks, drum, xylophone

Procedure:

1. Tell the story using the flannel board. Give the children the flannel pieces. The children place the pieces on the board as their part appears in the story. As the teacher tells the story, she plays sound effects with rhythm instruments: bells for the waves, the rhythm sticks for the cracked egg, a drum for the log and the ship (soft for the log incident--loud for the ship incident), and the xylophone for the home. The children help to tell the story through the teacher's questions: What sound does the duck make? Why can he swim? How do you think he felt when he was lost? When he was saved? What would he say to the bird? What is he thinking now?

2. The teacher suggests that the children become the little duck. They go to their own space in the large area of the room. The teacher asks them to show the duck in the egg, cracking open, being a newborn, being older, swimming. She asks questions to stimulate speaking: "What does he say when he comes out of his egg?" etc. The questions during the previous storytelling aid the children to speak. The teacher can take on roles to ask these questions, e.g., being another animal in the barnyard. A child can also choose this kind of role although the focus in this lesson is on building characterization in depth and one or two characters is all that is desired. The teacher indirectly cues the children for body part awareness as the duck moves, e.g., "He tries to crack the egg with his back, then his

wings, etc." She can also talk of original movement being offered by a child. The teacher narrates as the children develop the character of the duck. The teacher suggests that a child play the percussion instruments. Dialogue is encouraged during the part when the bird saves the duck. The teacher cues the children to work in pairs as the bird flies the duck home. The emotions of the homecoming with the duck's mother are heightened through questions, e.g., "What did the mother do when the duck came back? How did the duck feel?"

3. During snack the teacher comments on good locomotor and non-locomotor movement, e.g., run, fall, roll, ideas, speaking, emotions, and flexibility in changing roles observed during the playing.

4. During free play and on subsequent days at this time, set out this story as a self-directed activity. Set out the flannel board and pieces, the book and the instruments. Later the record can also be played.

4. Story Theatre

To develop ability to follow the logical sequence of a story
To develop ability to integrate the variety of elements in the playing of the story:
integration of their own character with others
integration of combinations of physical movements
integration of different original ideas into the story
the transition from one scene to another
To develop original ideas for a new character for dialogue and body movement
To further develop speaking

Equipment:

Books: Little Rabbit the High Jumper, by Miriam Schlein (New York: Hm. R. Scott, 1958); "The Three Rabbits," Stories to Dramatize, by Winnifred Ward (New York: D. Appleton-Century Crofts, 1947)
Record: "Honky Tonk Cat," by Elton John

Procedure:

1. Read Little Rabbit. Ask children for information about rabbits: their appearance, their movements, their activities.

2. Tell the story "The Three Rabbits." Suggest that the children play the story. The children select who they will be. Ask: "Who would like to be a rabbit? What kind of rabbit are you? What do you look like? Find a rabbit hole of your own and show your rabbit." More than one person can be one character. Then they select where the action will take place. Ask if they have any new people for the story. Ask if they have a new place where the story can take place. Use all ideas in the story.

3. Suggest that children find their own space in the large open area of the room. Play the tamborine. When it is hit, the children move as rabbits around the room. Jump. Hop. Leap. What might they hop to? Why are they running? What are they leaping over? Can you put these together? When it is shaken, they stay in one place and do non-locomotor rabbit movements, shaking fur, ears, wiggling nose, looking quickly around, eating. Encourage movement suggestions.

4. Play the story. Narrate "The Three Rabbits." The children play the various parts fading in and out of roles they have chosen. In the beginning, play the record "Honky Tonk Cat" as a movement stimulus. Suggest that the children combine some locomotor and non-locomotor movements to characterize their rabbit. This pattern can be repeated throughout the story when the rabbits play their part, e.g., run, run, jump--sniffing, scratching, turning, shaking fur. Give children indirect cues to elicit good movement and dialogue. "There is one rabbit shaking his fur;" "And the rabbit said . . . ."

5. Repeat the story. Encourage a child to narrate. Assist where needed in storytelling. Children can change parts, add new material. Suggest they tell much of the story through their dialogue and movement.

5. Playmaking

To develop ability to form a logical story sequence from original ideas presented to group showing a beginning, a climax and an end
To develop self-direction in the planning and playing of the story
To develop ability to reveal the story through dialogue, movement and special effects without the technique of storytelling
To develop ability to organize and cooperate in a group

Equipment:

1. Book: Caps for Sale, by Esphyr Slobodkina (New York: William Scott, 1957)
2. Hats, box of material and clothespins for costumes
3. Rostrums for scenery
4. Large hand flashlight for light effect
5. Loops for creating sets, sub-sets and intersecting sets

Procedure:

1. Read Caps for Sale. The children participate. They name colors of hats, make monkey noises, pantomime hand actions and call "Caps for Sale, .50 a cap."

2. Set out hats in circle. The children walk around hats. Give each a number. Say their number. The children try on a hat, then another, then another. Finally choose one. Ask: "How would the person walk, eat? What would they wear?" Set out a box of costumes in the same manner. They choose material to wear for their character. Ask: "What one thing would he do?" Practice this in your own space on the tiled area of the room. Suggest job actions, e.g., a construction worker digging.

3. Group children into groups of three. They make up a story including each of the children's characters. Float between groups to help them form a story. Ask children to show who, where and what happens. One group shows the other their play.

4. Have a group planning session. Suggest that the children combine the separate group stories into one story. Ask: "How can we join these stories together? How can we connect the people and place of one story with another?" In this story a suitable connection could be to create the setting of a city where many people are doing many different jobs. Play the story.

5. Now play through the story of Caps for Sale incorporating the original scenes where appropriate. The setting of a city can be used again since the main character in the story has the job of selling hats in a town. Ask: "How can the new story we created be joined with the story Caps for Sale? What part of the story can use this new section? The road scene? The woods scene or the town scene?" Ask: "What percussion instruments or music would add to this story? Can it use special lights? Does the time of day change?" When the complete story is played, the teacher can

introduce it, interject transitions if needed and bring it to a conclusion.

6. After the session refer to the day's objectives. Support each child for their contribution. Particularly note abilities in self-directed planning and playing, revelation of the story through dialogue and movement, and group cooperation.

Interdisciplinary Supplements for Caps for Sale
Theme: The City

Other Subjects:

Social Studies

1. Discuss the city. Show pictures and discuss jobs people do in the city: the mail carrier, the sanitation workers, the house builders, people who sell things.

Art

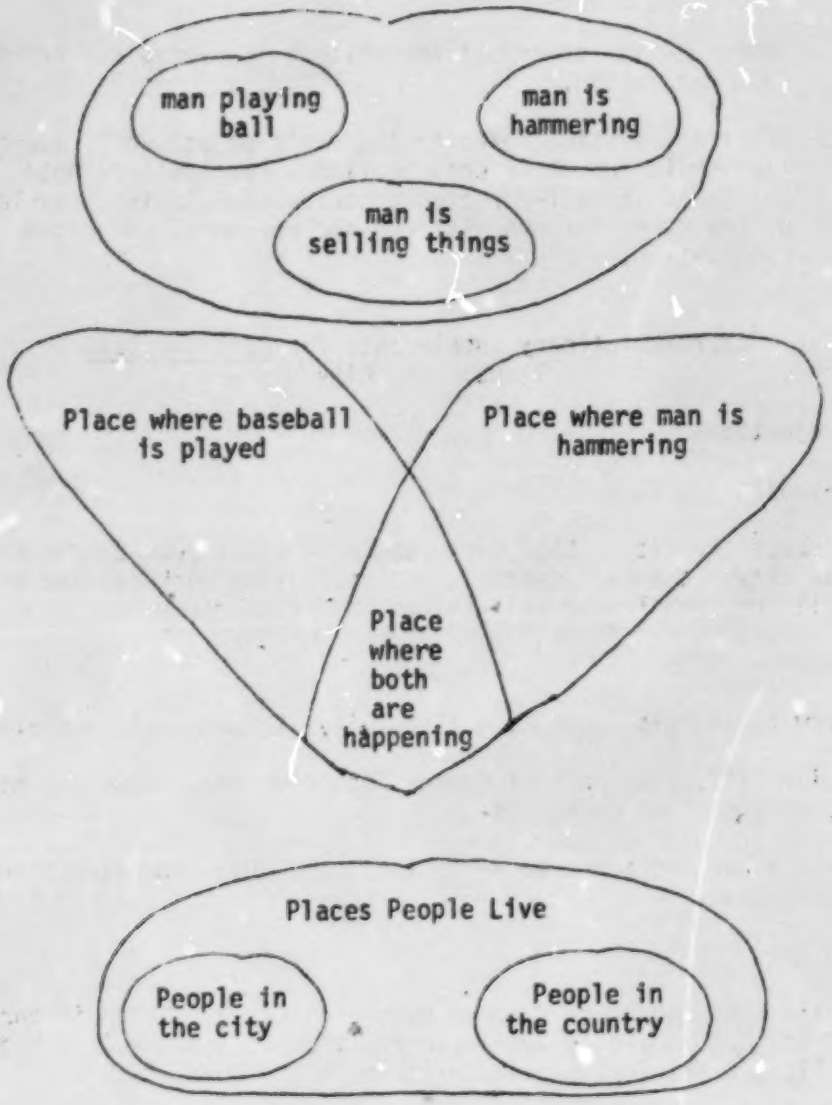
1. Draw two murals. One is a clean city, the other is a dirty city.
2. Build different kinds of houses from clay and sticks and miscellaneous collage materials.
3. Make a car and a bus to go to the city. Use cardboard boxes. Paint them.

Language Arts

1. Write down the story made up by the children. Ditto it and read it to them. Make it available for them to look at in a book of collected original stories written in big type.
2. Set out the work job "Mailman" (Work jobs). They write name and addresses and mail to matching cards.

Math

1. Use vocabulary and graph for intersecting or sub-sets but use content from story to show how to elaborate on various sections of the story:


man playing ball
man is hammering
man is selling things
Place where baseball is played
Place where man is hammering
Place where both are happening
Places People Live
People in the city
People in the country

Free Play Outside:

Pick up litter in the playground.

Free Play Inside:

Set up a dramatic kit for the post office. Provide envelopes, stamps, letter box, a stamp pad and stamper, a pencil.

1. Add previous kits in a cumulative activity of making a city. Set up the kits of the store, the doctor, the restaurant, the repair shop, the bank, the hat store.

2. Provide two puppets who are mail carriers and two other people puppets.

Other applications:

Take a field trip to the city. Go to the post office and mail a letter. Interview a mail carrier. Buy yogurt at the yogurt stand.

These two plays were self-directed. First one was played, then the other was played. Then the two were played at the same time to create the city where the peddler came to sell his hats. The story of the Peddler was played in very simple form. He came down the road with his hats. He came to the city saying Caps for Sale .50 a cap. He watched this village scene take place. Then he tried to sell them a hat. He sold some but not many. He went away from the city to the country where he fell asleep. The monkeys stole the hats. He woke up, discovered them wearing the hats and tricked them into dropping them. He was not angry. He teased them. Then he went on.

A PLAY

A work man was hammering in his shop. A baseball player hit a ball in a baseball field. A ball was hit and accidently hit the workman. A policeman who was out chasing robbers was called on the phone by the baseball player. They exchanged the facts and went to see the workman. He said he wasn't really hurt and so they all went back to their jobs.

A PLAY

A farmer came into town to give his vegetables to a vegetable man. The vegetable man bought his food. A cowboy came down the street. Suddenly an escaped bull came running down the road and almost bumped into the vegetable stand. The cowboy leaped up, pulled his lasso and pulled the bull down. The vegetable man thanked him and the farmer led the bull to his farm and put him in a cage.

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Appendix B

Workshop Report: A Program of Math Instruction for Very Young Gifted Children
by Nancy Cook

There has been some research devoted to how young children aged four years and older acquire mathematical concepts (National Council of Teachers of Mathematics--NCTM--37th yearbook, 1975). However, there has been very little study of how gifted children at these ages acquire such concepts. In addition, there has been little work focused on how the very young child, three years and under, acquires mathematical prerequisites, and no work focused on how very young gifted children acquire these prerequisites. And at the apex of our ignorance as to how young gifted children acquire mathematical concepts is a mounting controversy centering around concrete versus abstract (or in Piagetian terms - formal) thought. Webb (1974) reports that for bright children between the ages of six to eleven years the acceleration within the concrete operational stage is rapid, and while there is some acceleration from the concrete to the formal operational stage, it is not as pronounced. It is as if bright children rapidly reach a cognitive plateau and then explore the meadows before resuming the steep climb to formal operations. The implication of Webb's findings is that young gifted children, while advancing rapidly within the concrete operational stage but not to the formal operational stage, would require an emphasis on concrete rather than abstract experiences. In contrast, Dowker (1976) reports anecdotally that gifted children as young as four years have a "well established abstract concept of number and number operations and . . . many have trouble with a concrete approach."

The purpose of this paper is to outline a mathematics curriculum appropriate to pre-school gifted children. In light of the paucity of data, not to mention the contradictory nature of the data, on how young gifted children acquire mathematics, one might well ask what is the basis of the suggested curriculum? The author has no choice but to

cautiously accept the assumption, based on the results of Webb (1974) and Keating (1976), that gifted children follow the same developmental pattern of acquiring mathematical concepts as do normal children, only at a faster rate of development. However, the uncertainty of this 'same but faster' model necessitates that continual diagnostic assessment will be a major part of the proposed mathematics curriculum.

Diagnostic assessment is an important factor in any mathematics program (Reisman, 1972). Mathematics is hierarchically structured; that is, one concept builds upon another. For example, a child must be able to perform the operation addition on the numbers 1 through 9 and must understand the concept of place value before s/he can add 12 and 8. There is considerable data concerning the sequencing of mathematical development in young normal children (NCTM 37th yearbook; Reisman, 1977; Heimer and Trueblood, 1977). Since mathematics is so sequenced, any program of instruction must be based on the child's present state of knowledge. And it is through diagnostic assessment that the child's knowledge is determined. Thus, with normal children diagnostic activities are an essential part of the mathematics curriculum. However, with gifted children, the diagnostic assessment serves an additional purpose. The teacher of the gifted child, like the teacher of the normal child, must discover what the child does and does not know in order to plan a program of instruction for that child. Diagnostic activities with gifted children, as with normal children, will be the basis of program planning for the individual child. However, while much is known about the sequence in which normal children acquire math, little is known concerning the similarities and differences in the learning patterns of gifted compared to normal children. Therefore, continual diagnostic assessment of the progress of gifted children will yield the much needed data concerning how young gifted children acquire mathematics, thereby permitting an analysis of the similarities and differences in the learning patterns of normal and gifted children.

Mathematics is broad in scope and covers many very diverse topics from operations on numbers to graphical representation. While

diagnostic assessment will be specific to each topic of mathematics, there are some general cognitive skills which are prerequisite to more topical mathematical exploration. For instance, the basic concepts of classification, seriation and correspondence are prerequisite to further work on number, and the child's concept of space is a critical factor in further work in geometry, measurement or graphical representation. Diagnostic activities in these cognitive domains are as critical to the curriculum planner of the preschool child as are the more topical diagnostic activities.

Diagnostic activities are an integral part of any mathematics curriculum, and they serve a dual purpose in the planning for the gifted child's program. Since the diagnostic activities are such a vital part of the mathematics program, they will be discussed as part of the proposed pre-school curriculum. However, let me give one example of such an activity at this point.

Classification or sorting is based on properties common to the objects being sorted. The first sorting experiences of the child are based on perceptual properties of the class, such as size or color. Number is also a property of the class. However, number is not a perceptual property. It is an abstract property. Classification based on physical attributes precedes classification based on abstract, logical structure. Sorting based on one physical attribute is mastered long before the concept of number, but it is a critical prerequisite.

The basic classification diagnostic activity consists of giving the child a pile of blocks the attributes of which vary along one or more physical properties and asking the child to put the blocks that are alike in the same pile (see Figure 1).

The three year old child usually makes a design with the blocks, like a face or a house. When the child first attempts to sort the blocks, s/he can't really do it. Suppose the child puts the big red square next to the big blue square. You think the child is going to put all the squares in a pile. Then the child puts the big blue circle next to the squares. It's as if the child changed criterion from shape

SELECTED ATTRIBUTE BLOCKS

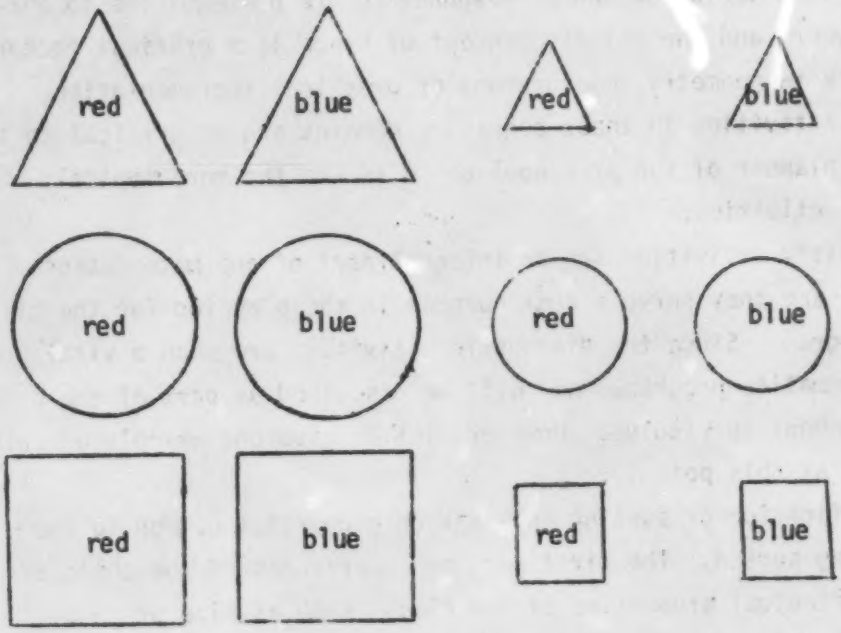


Figure 1.

(square) to color (blue). The child is unable to keep in mind one attribute when there are multiple attributes from which to choose.

The first sorting task that is mastered is the ability to sort by one attribute when there is only one variable. That is, if the child was given a pile of blocks that varied in color only, say all big squares, the child could put all the blue ones in a pile. The next step is the ability to sort by one attribute when two or more attributes are varying. For example, the child is able to put all the blue ones together when given blue, red and green circles and squares. Figure 2 gives the developmental sequence of classification.

For a detailed discussion of this developmental progression, including the diagnostic activities, see Copeland (1974a, b).

Figure 2 shows the hierarchical nature of the development. Mastery at each level is prerequisite to the next level of mastery. For example, the child is first able to classify by one attribute only when there are no distracting variables, when there are no other attributes varying. Next the child can classify by one attribute even when there are distractions. Then the child can classify by two attributes, etc.

The use of this task in diagnosing a child's knowledge is straightforward. Start with a group of blocks that vary along many attributes. If the child is unable to sort by one attribute remove all but one shape of blocks. If the child succeeds proceed to the next level. Copeland and the Nuffield Guides Checking Up I and II (1970, 1972) offer detailed discussion on procedures.

Piaget: Implication for Education

Piaget's theory of development has been reviewed and analyzed by a variety of psychologists (Flavell, 1963; Ginsburg and Opper, 1969). In addition the implication for education based on Piaget's theory of development have been presented by a number of educators (Furth, 1970; Copeland, Wadsworth, 1971; and the Nuffield Mathematics Project Guides, 1967-72). In fact, many of the current texts (1977) for teacher education include an introductory chapter on Piaget's theory and its implication for education.

DEVELOPMENTAL SEQUENCE OF CLASSIFICATION

design only

classify by one attribute when only one attribute varies

classify by one attribute when more than one attribute varies

a. positive (put all the red together)

b. negative (put all the not red together)

classify by two attributes

a. red and square

b. red or square

c. not red and not square

d. not red or not square

two way classification

color →→→

shape ↓↓↓

class inclusion

show the child six daisies and two tulips -

"Are there more daisies or flowers?"

Figure 2.

Piaget theorized that the child progresses through four stages of development: 1) the sensori-motor period, lasting from birth to about 2 years, during which knowledge is acquired through ACTION UPON OBJECTS; 2) the pre-operational period (later labeled a period of transition from the sensori-motor stage to the concrete operational stage) spanning the years from two to six, during which time the child is developing the skill to MENTALLY REPRESENT his/her action upon objects; 3) the concrete operational stage, lasting until adolescence, during which time knowledge is abstracted from ACTION WITH OBJECTS; and 4) the formal operational stage wherein the young adult is no longer by necessity tied to the acquisition of knowledge through concrete experience only. In summary, the child first learns by acting upon objects with no symbolizing, verbal or written, accompanying the action (sensori-motor stage), followed by a period in which the ability to represent this action develops. The developing ability is not the ability to represent just anything but rather the ability to represent that which is already known through action (the pre-operational or representational stage). The concrete operational stage follows; the child is developing capabilities of abstraction, again, not the ability to abstract in general, but rather the ability to abstract that which is known through action, through manipulation. It is not until the formal operational stage that the young adult is somewhat free of concrete experiences. However, recent work with college students (Arons, Monk and Moore, unpublished) is showing that even at this late age, there is much dependency on concrete manipulation upon the introduction of a new concept.

The implications for mathematics, in particular, follow.

Step 1: ACTION UPON OBJECTS

New concepts are introduced through the physical manipulation of concrete objects; no symbolization, either verbal or written, should be required or requested. This type of activity should continue until the ACTION UPON becomes automatic. Verbal symbolization is frequently introduced by the child, and upon its first appearance should be encouraged.

Step 2: REPRESENTATION OF KNOWN ACTION

Verbal representation is the first form of symbolization of known actions. Let me point out that the teacher, of course, presents the problem via verbal expression. Verbal representation by the child of his/her own action is the first form of symbolization, and as mentioned above, is usually introduced by the child. That is, the teacher should not press for verbal representation until the action is automatic or (as more often is the case) until the child spontaneously offers it. Children naturally talk about what they are doing, and will talk about their mathematics experiences.

Written symbolic notation should be next introduced. When the action is automatic, the child should start recording his/her action. This is the step that is usually omitted. Too often the teacher introduces a concept via manipulative materials and when the action becomes automatic, the materials are put away (either permanently or temporarily) and the teacher introduces the concept using symbolic notation, leaving the task of bridging the gap between the action and the symbolization of it totally to the child. Symbolic notation should be introduced by having the child record that which s/he already knows enactively, by having the child record his/her own action. When the recording of one's own actions becomes automatic, the child should begin to record a partner's actions.

Step 3: SYMBOLIC NOTATION WITHOUT CONCRETE AIDS

Step 3 is the paper and pencil stage throughout which the child is able to work at the symbolic level without the use of concrete aids. However, the concrete objects should always be available (they will be needed for the introduction of the next concept) and no stigma should be attached to their use. The child will most likely move to step 3 on his/her own. The use of manipulative devices is initially favored by the child, but the aids become cumbersome as the child becomes able to work mentally at a faster rate. Therefore, the child will usually "wean" himself/herself from the manipulative devices and further work on a particular concept that can be continued at the symbolic level.

An example will clarify the three-step instructional program. The behavioral objective in this example is to teach the child the operation subtraction on the whole numbers 1 through 20. Young children like to play store, and most have actually had the experience of going to the store to buy candy or ice cream unaccompanied by an adult. Therefore, the game of store is a mathematical experience that builds on past experience and is positively motivating. Create a play store in one corner of the room. Have a rotating 'storekeeper.'

Step 1: ACTION ONLY

Give the child play money, either $1's or 1¢'s:

a. simple problems - no regrouping involved
problems relayed verbally
example: child has 4¢; child is instructed to go to store and buy gum which costs 3¢; after transaction takes place, child is asked "how much money do you now have?"

b. introduce renaming activities
in addition to the $1's or the pennies, give the child either $10's or dimes
example: child has 15¢ (15 pennies); (at this point you can set up a play Bank where change is made. This creates the position of 'banker' again filled by the children on a rotating basis. The experience gained as storekeeper or banker is great.); child is instructed to go to the bank and exchange 10 pennies for one dime or to exchange one dime for 10 pennies.

c. preliminary work leading to regrouping
example: child has 15¢ (one dime and 5 pennies); child is instructed to go to store and buy candy which costs 4¢; after transaction takes place, child is asked "how much money do you now have?"

d. subtraction with regrouping
   example: child has 15¢ (one dime and 5 pennies); child is instructed to go to store and buy milk which costs 7¢ (child must exchange dime for 10 pennies).

The children should have experience at each level until the ACTION is AUTOMATIC, after which they should move on to the next level. When subtraction with regrouping is an automatic action, then move on to step 2.

Step 2: SYMBOLIZATION OF KNOWN ACTION

Give the child in addition to the pennies and dimes a notebook in which to keep a record of all banking and store transactions. Repeat steps 1a. through 1d., but now have the child record his action. When the child can easily and accurately record his/her action, have him/her record a partner's transactions. When the symbolic recording of transactions is automatic, proceed to step 3.

Step 3: SYMBOLIC NOTATION WITHOUT CONCRETE AIDS

The child, if s/he can read, can begin to solve written word problems. If the child cannot read, the word problems will have to be presented verbally. Initially, upon presentation of a word problem, the child can go to the store, carry out the desired transaction and record it. Eventually, the child will not need or want to go to the store, but will solve the problems mentally.

Mathematics Curriculum for Gifted Preschoolers

Mathematics is a diverse field and the mathematics curriculum at any level of instruction, including the preschool level, should reflect this diversity. At a minimum the curriculum should include experiences in the following areas: 1) logic (initially logical classification); 2) number and numeration; 3) operations on whole numbers; 4) measurement (including time and the calendar); 5) geometry (with close attention paid to the

young child's concept of space); 6) pictorial representation (graphs and tables); 7) relations and mappings; and 8) patterns, including symmetries. Experiences designed for young children in each of these topics are discussed in Copeland, the Nuffield Guides and the NCTM 37th Yearbook. More specific instructional techniques can be found in Heimer & Trueblood, Reisman, and Thyer & Maggs (1971). The sequence of logical classification is discussed above. The developmental sequence of the acquisition of the concept of number followed by the sequencing of operations on whole numbers follows.

Number - what is it? There are two aspects of number, cardinal number and ordinal number. Cardinal number is what usually comes to mind when one thinks of number. Cardinal number is concerned with the property 'how many?'. The cardinal number two is a property of the set of two objects. The objects can either be alike or not. Two is a property of the set itself and has nothing to do with the perceptual attributes of the objects within the set.

There is another aspect to number, ordinal number, pertaining to the order in a sequence. The instruction of number must clearly differentiate between these two aspects. Let me give you an example. Suppose the instructor places one object, say a toy dog, in front of the child and says, "here's one dog." Then the instructor places another dog in front of the child and says, "here are two dogs." Next the instructor asks the child to show him/her "two dogs" and the child points to the second dog. The instructor, by sequencing the presentation of the dogs, has caused the child to focus on order. But the instructor had intended a focus on cardinal number. To avoid this confusion the instructor should place one dog in front of the child with an appropriate comment, then remove the dog and place two new objects, say cats, simultaneously in front of the child with the explanation, "here are two cats."

Cardinal number, answering the question "how many?", is an abstract property of set in that it is not tied to the physical attributes of the objects within the set. The cardinal number is concerned with how many, regardless of size, position, similarities, or any other physical

attributes. Young children do not initially understand this. Young children think that number is dependent on the size of the objects or on the position of the objects. Conservation of number, or the realization that physical attributes such as size and position are irrelevant attributes with respect to number, is a necessary prerequisite to further work on number concepts. Conservation is not a prerequisite to rote work, such as counting or rote addition, but rather is a prerequisite to the understanding of the concepts of numeration. For example, the pre-concrete operational child agrees that these two rows o o o o / o o o o have the same number of objects, but the same child does not think that the following two rows have the same number of objects o o o o / oooo. Is it surprising that this child is not bothered by the fact (according to himself/herself) that sometimes 2 + 3 = 5 and sometimes 2 + 3 = 6?

As mentioned earlier, mathematics is hierarchically structured. Numeration and the operations on whole numbers, subsets of mathematics, are also hierarchically structured. Figure 3 gives the sequence in which the concepts of numeration and the initial operations on whole numbers should be introduced.

The first diagnostic activity should focus on conservation. If the child cannot conserve, the mathematics experiences should focus on equivalence and non-equivalence based on 1-1 correspondence. If the child can conserve, work can begin on cardinal number.

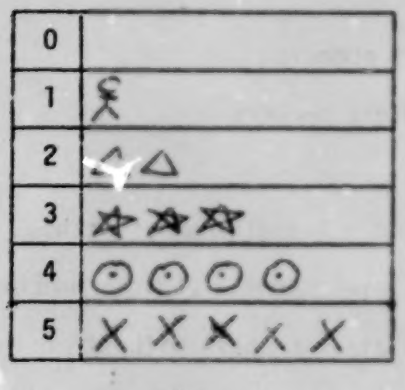
NUMERATION AND OPERATIONS ON WHOLE NUMBERS

1. set and set membership
2. one-to-one correspondence
3. equivalent and non-equivalent sets
4. conservation
5. cardinal numbers 0-9
6. set union
7. addition of 1-digit numbers
8. subtraction of 1-digit numbers
9. place value
10. sum of a 1-digit and a 2-digit number without regrouping
11. subtraction of a 1-digit from a 2-digit number without regrouping
12. sum of a pair of 2-digit numbers without regrouping
13. subtraction of a pair of 2-digit numbers without regrouping
14. sum of a 2-digit and a 1-digit number with regrouping
15. subtraction of a 1-digit from a 2-digit number with regrouping
16. sum of multiples of 10 where the sum is greater than 100
17. sum of a pair of 2-digit numbers with regrouping
18. introduction to multiplication through the addition of equal sized sets (this can be introduced earlier if numbers are kept small)

Figure 3.

The concept of number should develop from the notion of equivalent sets. Sets that can be put in 1-1 correspondence are equivalent and have the same number. The number names associated with each set must be introduced by the teacher. The process is facilitated by a 'standard set' illustrating each number name and its association with a particular sized set. See Figure 4.

STANDARD NUMBER CARDS



etc.

Figure 4.

The children's first experiences should involve ACTION only - making sets equivalent to the standard set. Very quickly, if not immediately, the number names will be associated with the appropriate sets. Further experience (ACTION) of making specific sized sets should continue until the actions are automatic. Then the focus should be on the numerals, the symbolization of the property number.

The initial work on addition (and subtraction) should focus on the union of sets - ACTION only. (I am going to talk about the introduction of addition, only; the introduction of subtraction should follow on its footsteps.) Once the action of joining sets is automatic, recording of the action, the addition of 1-digit numbers, follows.

Before further work on addition can begin, the concept of place value must be introduced. The previous example of 'store' is an example on one way to introduce place value. (For a more detailed discussion and further experiences see Heimer & Trueblood, 1977.) The concept of place value is a difficult one and is at the root of many later problems. Much time and many varied experiences should be devoted to the understanding of place value.

Once the child has a good grasp of simple addition and of place value, work can proceed through the remaining steps. At each level the more advanced addition and subtraction should be initially introduced through the use of manipulative devices, followed by the child's recording of his action, with the eventual discarding of the concrete aids.

There are a variety of materials that lend themselves to the introduction of number. Any small objects that are easy to place in 1-1 correspondence such as screws, nuts, beans, tiny plastic toys (of the gumball machine variety), pegs, coins (either real or pretend), to name but a few, are excellent for the initial introductory work on sets and equivalence. Cuisenaire rods are excellent for the introductory work on addition and subtraction as well as all further work on operation on numbers. Rods should be introduced and labeled by their color names (white, red, light green, etc.). After continued use, including symbolic recording of the work with rods (W + R = L), number names can be introduced through the game of "Planet" (see attached sheet).

Pegs and rubberbands--groups of 10 pegs with a rubberband around them as well as loose pegs--are best for work on place value. Play money--1's and 10's--are analogous to the groups of pegs. Work on a 10 bead abacus is also good for reinforcing the concept of place value.

Many of the current texts on methods of teaching mathematics to teachers give detailed discussion on both the materials available and their use. In particular, see Heimer & Trueblood, Reisman, Thyer & Maggs, D'Augustine and the Nuffield Guides.

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MATHEMATICS MATERIALS

The following materials can be purchased from

CREATIVE PUBLICATIONS
3977 East Bayshore Road
P. O. Box 10328
Palo Alto, CA 94303

ATTRIBUTE MATERIALS	$13.00/set
CENTIMETER (TWO) CUBES	5.00/100
CHIP TRADING ACTIVITIES	52.00/entire primary set
CUISENAIRE RODS	30.00/8 sets
GEOBLOCKS	40.00/set
GEOBOARDS	13.00/5
GEOMETRIC SOLIDS	20.00/set of 27
GRAPH PAPER	22.50/100 yards
MULTIBASE BLOCKS	165.00/set of set bases
PATTERN BLOCKS	17.50/set
PLAY MONEY	2.25
TANGRAMS	.40/set

ACTIVITIES WITH CUISENAIRE RODS AND NUMBER OPERATIONS

1. Free play

2. Make trains (ACTION ONLY)

   a. as long as paper is wide, as many trains as possible, no limit to number of cars in each train (save yellow and black paper trains if enough rods to do so)

   b. make as many 2-car trains as possible on orange paper

3. Verbalize train sentences

   light green plus red equals yellow

4. Symbolize trains (REPRESENT OWN ACTION)

   LG + R = Y

   Y + Y = O

5. Symbolic manipulation

   a. pictorial

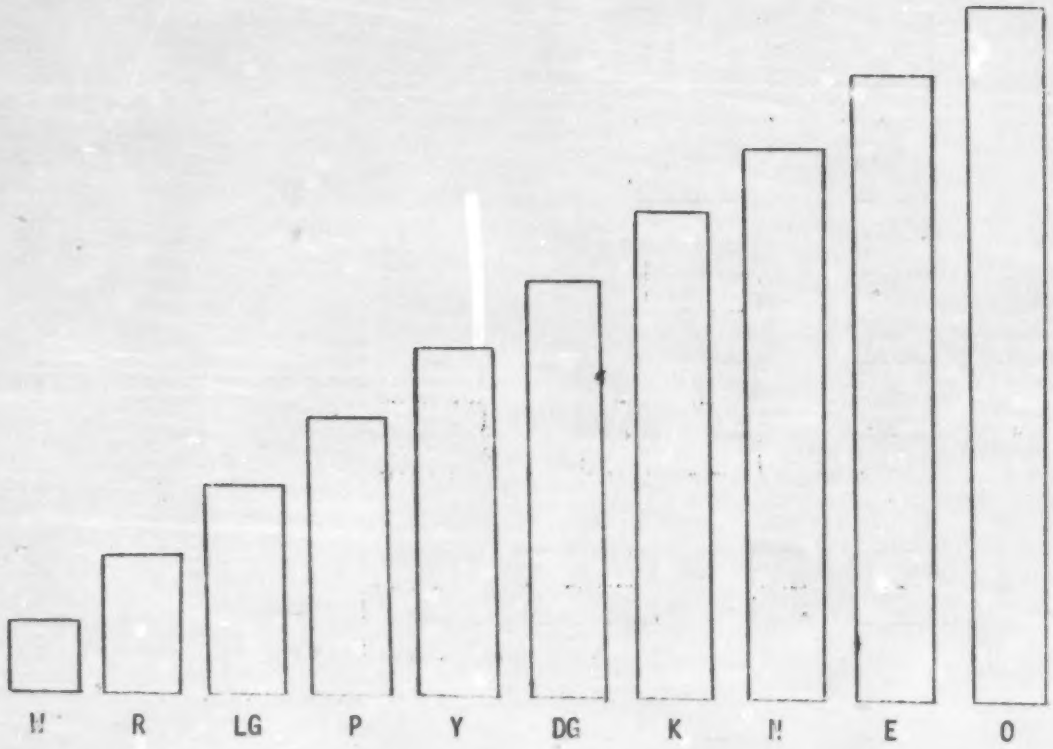
   b. with symbols (Concrete Algebra)

   LG + P = _____

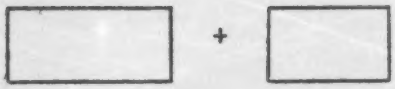
   _____ + Y = K

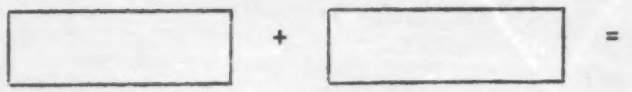
6. Planet Game (see handout)

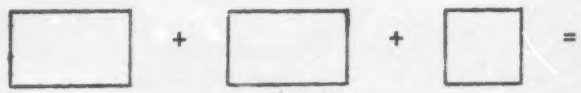
CUISENAIRE CODE

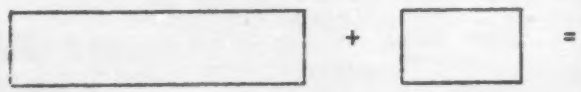


CONCRETE PROBLEMS WITH CUISENAIRE RODS
(problems can be drawn on cards
for independent use by children)









CONCRETE ALGEBRA

1. W + R = _____
2. P + LG = _____
3. DG + Y = _____
4. K - W = _____
5. K - P = _____
6. R + _____ = DG
7. Y + _____ = K
8. _____ + LG = N
9. _____ + Y = K
10. R + W + _____ = N

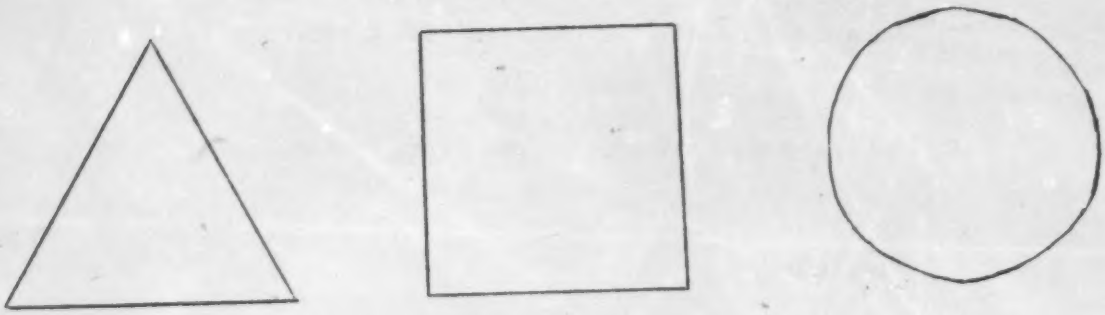
PLANET GAME

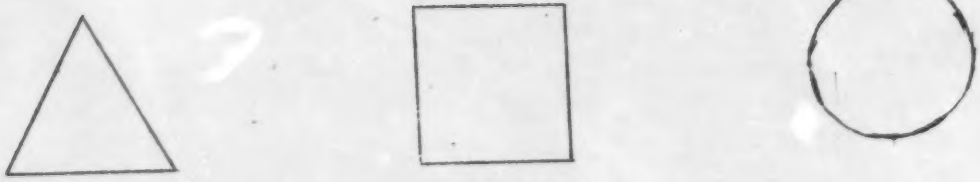
Today we are going to travel to the Red Planet. On the Red Planet the red rod is assigned the number value one. That is, the red rod is called the number one rod.

1. Find the Red Planet number 2 rod.
2. Find the Red Planet number 3 rod.
3. What number value is assigned to the white rod?
4. What number value is assigned to the orange rod?
   Make some trains equivalent to the orange rod.
   What is the number sentence of each train?
5. Make up a Red Planet problem.

PATTERNS FOR ATTRIBUTE BLOCKS OR CARDS

Temporary attribute blocks can be made out of colored tagboard. You will need 4 colors, say red, blue, green and yellow. Trace the patterns on the back side of the tagboard and cut out.





ACTIVITIES WITH ATTRIBUTE BLOCKS

1. Put just the red blocks on the table.

   "Make a set of squares."

2. Put all the blocks on the table.

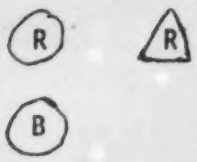
   "Make a set of all green ones."

3. Make a set of all the <u>not</u> blue ones.

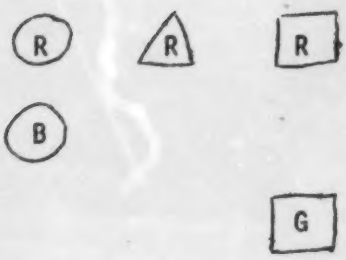
4. Make a set of all the red or circular ones.

5. Make a set of all the red and circular ones.

6. Complete:



7. Complete:



Appendix C

Sample Parent Questionnaires

Longitudinal Study and Model Preschool Program

Child Development Research Group
Guthrie Annex II, MI-20
University of Washington
Seattle, WA 98195
Telephone (206) 543-4160

Family History Form

The information requested on this form will be used to compile general descriptive data on the children in the research sample. All information will be kept strictly confidential, as outlined in the enclosed Consent Form. Although we would like to have complete information on every child, we understand that some parents may be reluctant or unable to answer certain questions. Please feel free to skip any questions you find objectionable.

Child's Name_____ Today's Date_____
last first middle year month day

Address_____ Child's Birthdate_____
Street City year month day

_____
State Zip Code

Home Phone_____ Office Phones (Father)_____ (Mother)_____

Child's Sex: M___ F___ Place of Birth_____ Adopted? Yes___ No___

If yes, age at adoption:_____

Languages spoken in the home:_____

Race/Ethnic Origins (check one) Caucasian___ Black___ Asian___ Chicano___
American Indian___ Other (Please specify)_____

Family Information:

	Father	Mother	Sisters and/or Brothers*
Full Name			
Living in Household?			
Place of Birth			
Race/Ethnic Origins			
Education (highest level)			
Occupation**			
Birthdate			

*Please use back of page for additional family members as needed.

**Please specify position and type of work in some detail (e.g., "high school music teacher," rather than "teacher").

Please list any other members of your household:

Name	Age	Sex	Relationship to child

How did you first learn about this research project? (Check one)

City Newspaper___ Community Newspaper___ Television___ Radio___.
U.W. Referral Service___ School or Day Care___ Doctor___
Friend or relative already participating___ Other___

Do you wish to have your child considered as an applicant for the 1977-78 Child Development Preschool?

Yes___ No___ Need further information___

Please use the form below to summarize your child's experiences with day care, babysitters, or preschool.

Child's Age (years)	Type of care: (sitter in home, preschool, play group, etc.)	Approximate number of hours per week
0-1		
1-2		
2-3		
3-4		
4-5		

If you would like your child's babysitter or preschool teacher to provide us with information about your child's interests and abilities as they are expressed in a school or day care setting, please check the appropriate space below. If you wish, we will send you a brief questionnaire, consent form, and stamped envelope which you can pass on to your child's caretaker.

I would___ would not___ like to have a caretaker questionnaire mailed to me.

We are interested in following the development of children in our project for a period of several years. Please indicate the name of a friend or relative who will know how to reach you, should we lose contact with your family.

Name_____ Relationship_____

Address_____ Telephone_____
Street City

_____
State Zip Code

12/76

Child's Name_____

Date_____

CHILD DEVELOPMENT RESEARCH GROUP
University of Washington

PARENT QUESTIONNAIRE
Part I

Instructions: Your answers to this set of questions will help us get a sense of your child's abilities, interests and personal style. Please feel free to add any information you think might be useful in giving us a picture of what your child is like. Use the back of the questionnaire or extra paper if necessary. Please try to be as specific as possible in describing your child's interests and accomplishments. If you can spare some copies of your child's creative work we would be delighted to have them.

1. Please describe the kinds of things your child has done which you think might indicate advanced intellectual ability.

2. What kinds of building or art work does your child do? Please describe your child's favorite building or art materials and the work s/he creates. For instance, does your child build walled castles with wooden blocks? Scribble enthusiastically with pen or pencil? Make animals out of playdough? Paint geometric designs with watercolors, etc.?

3. What topics or ideas does your child find most interesting? Please describe what your child's interests are and how the interests are expressed. For instance, is your child a car and truck enthusiast who collects cars and trucks in any form available? Has your child mastered specific information connected with a favorite topic, such as memorizing the names of many species of dinosaur? Does your child have a variety of interests or a single, intense enthusiasm?

4. Please describe any imaginary games your child plays. Are other people (real or imaginary companions) likely to join in this play? Does the play involve props such as a toy house and people, "dress up" clothes, or household objects? Are there particular themes (Batman, playing house, etc.) which your child especially enjoys acting out?

5. Does your child show a strong interest in any form of music? For instance, does your child express enthusiasm for particular kinds of music heard on the radio or record player? Does your child sing on key? Dance? Play a musical instrument?

6. Does your child show a strong interest in how things work? Has your child taken apart and reassembled complex toys or household objects, working alone or with some help?

7. Does your child like to make up rhymes or stories? Please describe any ways in which your child has used language creatively.

8. Please describe how your child adapts to the spatial environment. For instance, does your child give you directions on how to drive to a familiar destination? Does your child show understanding of how to find his/her way around the house? in familiar stores? in the immediate neighborhood?

9. Please describe any instances in which your child has displayed an interest in ordering or grouping items in some systematic way. For example, a child might create a block building in which each section is composed of blocks of a single shape or color. Another child might sort a doll collection by size or type, or arrange crayons to form a rainbow-ordered sequence of colors. Is this type of play a favorite or frequent activity for your child?

10. Please list by name or describe the books your child most enjoys looking at, listening to, or reading.

11. When your child is playing alone, how much time is s/he likely to spend in one activity? What kinds of play hold your child's interest for the longest time?

12/76

Child's Name_____

Today's Date_____

CHILD DEVELOPMENT RESEARCH GROUP
University of Washington

PARENT QUESTIONNAIRE
Part II

Instructions: The following questions call for your best estimates of when your child first showed certain behaviors. We realize that you may not remember first ages for all of these behaviors, but please give us an estimate whenever you can. Some parents find it helpful to pinpoint their children's achievements in terms of events in family history such as a vacation trip or change in day care situation. If you have kept records of your child's early development in a baby book or journal, or if you are certain of particular ages for any reason, please note this in the spaces provided.

If your child speaks a language other than English, please note the language to which your answers refer. If you are not certain whether your child has mastered a particular skill, you might wish to observe his/her language or behavior for a few days to see whether the behavior is displayed. In some cases you may want to present a task, such as drawing a circle, as a game for your child to try.

If your child has not yet mastered a particular skill, please check the last age bracket given and note in the section for comments that your child has not yet performed the behavior. Several of the items in this section refer to behaviors that most children do not master until age 2½ or 3 years.

Your comments on each question will be very helpful to us. Whenever possible, we would like to have examples of your child's language, an account of how quickly your child attained a particular skill, etc.

1. At what age (in months) did your child say his/her first words?

___Before 8 months ___Between 8 and 10 months ___Between 11 and 13 months ___After 13 months

Comments:

2. At what age did your child first put two words together to form a simple sentence such as "more milk," "daddy go," etc.?

___Before 12 months ___Between 12 and 14 months ___Between 15 and 17 months ___After 18 months

Please give examples of your child's first sentences.

Comments:

3. When was your child able to point to at least three body parts such as hair, mouth, hands, ears, toes, etc. when asked to do so?

___Before 12 months ___Between 12 and 14 months ___Between 15 and 17 months ___After 18 months

Comments:

4. At what age did your child first have a vocabulary of about 50 words?

___Before 18 months ___Between 19 and 21 months ___Between 22 and 24 months ___After 25 months

Comments:

12/76

Child's Name_____

Date_____

CHILD DEVELOPMENT RESEARCH GROUP
University of Washington

PARENT QUESTIONNAIRE
Part III

Instructions: The questions in this section cover a variety of behaviors which children might display during the years from two to five and beyond. The questions are not listed in any particular order. We would like to know whether your child does, or has previously done, the behavior listed. As in Part II, you might wish to observe your child for a few days or present some items directly in order to determine whether your child does indeed have the skill in question. Again, your comments are most welcome. How a child does something is often as important as whether or when a skill has been mastered. Please note whenever you refer to a skill demonstrated in a language other than English.

1. Does your child recognize and name two-digit numbers?

   ___Yes ___I think so ___I don't think so ___No, not yet

   Comments:

2. Is your child able to print over 13 letters in the alphabet without copying?

   ___Yes ___I think so ___I don't think so ___No, not yet

   Comments:

3. Does your child build intricate or symmetrical structures or designs using blocks, milk cartons, play dough, or other materials?

   ___Yes ___I think so ___I don't think so ___No, not yet

4. Is your child able to draw a person with at least some representation of legs, body and or head and eyes?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

5. Can your child draw or copy a diamond?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

6. Has your child asked the meaning of abstract words (for example, "space," "justice") which he or she has heard in conversation?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

7. Does your child read books, such as WINNIE THE POOH, which contain long stories and few pictures?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

8. Does your child either print several words without copying, or spell several words with the aid of magnetic letters, blocks, etc.?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

9. Does your child tell time by the hands on the clock?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

10. Does your child understand and use the names for the days of the week. For example, if today were Thursday, could your child tell you that tomorrow would be Friday and that yesterday was Wednesday?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

11. Is your child able to read a simple book, such as HOP ON POP, or other kindergarten-level books, and recognize most of the words?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

12. Has your child solved problems that involve the subtraction of small numbers?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

13. Has your child recited from memory either the complete alphabet or numbers from 1 through 20?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

14. Does your child answer correctly when asked if he or she is a boy or girl?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

15. Does your child ever make up snatches of a song or story elaborating on new ideas or words?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

16. Does your child "sound out" new words that he/she does not recognize by sight?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

17. Does your child ever use the conjunctions "however" or "although" in a sentence? An example would be: "I don't like the color blue, however, that's my sister's favorite color."

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

18. Does your child recognize and name 5 or more printed words in books? Words found on signs are not included.

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

19. Does your child recognize the numbers from 1 through 9?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

20. Has your child ever made or used a simple map?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

21. Does your child notice and comment on words that rhyme?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

22. Has your child put together puzzles of over 30 pieces in which the pieces are all part of the same picture?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

23. Has your child written a brief note or letter to a relative or friend?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

24. Does your child know his/her address or telephone number?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

25. Has your child ever mentioned that he/she was putting something in a certain place so it would be easier to find later?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

26. Does your child recognize and name 13 or more letters in the alphabet?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

27. Has your child solved problems that involve the addition of small numbers?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

28. Does your child sing any popular adult songs, such as those heard on the radio?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

29. Is your child able to identify at least six colors?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

30. Has your child solved problems which involve either simple multiplication or division?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

31. Is your child able to count a set of objects from a larger group? For example, from a group of 8 blocks could your child count out a set of 3, 4, etc.?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

32. Does your child know which of his/her hands is left and which is right?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

33. Does your child seem to know where things are in the house, can he/she tell you which way to turn in order to arrive at a familiar place when traveling by car?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

34. Has your child commented that two objects are similar because of shape? For example, has your child remarked that a banana is like a moon or an orange is like a ball because of their shapes?

___Yes ___I think so ___I don't think so ___No, not yet

Comments:

Appendix D

Sample Final Preschool Report

CHILD DEVELOPMENT PRESCHOOL
University of Washington
Guthrie Annex II, NI-20
Seattle, Washington 98195

FINAL PRESCHOOL REPORT

Child's Name P Date August 23, 1977

STAFF

PROJECT DIRECTOR:

Halbert B. Robinson, Ph.D.
Professor of Psychology and
Chairperson, Child Development
Research Group

EDUCATION COORDINATOR:

Wendy C. Roedell, Ph.D.
Research Assistant Professor,
Child Development Research Group

HEAD TEACHERS:

Anne S. Hall - Mathematics
Joy Henke - Art

ASSISTANT TEACHERS:

Claire Leary - Drama, Music, Movement
Lisa Friedman - Social Studies
Nancy Pratt - Science, Art
Elise Westmoreland - Language Arts
Anthony Anwukah - Language Arts
Jacqueline Gramman
Douglas Martin

P has grown in social, physical and cognitive skills this year. Socially, he has been consistently cheerful, friendly, and outgoing toward children and adults. He thoroughly enjoys another child's company, shares generously, cooperates and expresses his appreciation of others' products. He is able to offer direction to play as well as accept another child's direction. He is very independent and responsible and can settle conflicts verbally when necessary.

P's fine motor skills are outstanding. He writes neatly and draws tiny details. Using pattern blocks or other manipulatives, he can make incredibly intricate, carefully balanced designs. He enjoys the outdoor equipment, sliding, climbing, digging and moving heavy blocks with skill.

P's cognitive skills are outstanding. He has a long attention span, being able to plan out a project and then spend up to forty-five minutes absorbed in completing it. He is highly creative and shows imagination and resourcefulness in his play, as the day that he was playing "doctor" with a group of children. Having set up the office, he went on to envision the street outside the office, and constructed and then ingeniously set up traffic signs to guide the cars. His drawing skills are extremely advanced. He is one of the few children we have seen here who can draw a three-dimensional object, as a staircase, so that it looks three-dimensional on paper. This spatial ability shows up in mathematics, where he can create and recreate intricate symmetrical designs. His ability to observe carefully and reason logically and his enthusiasm for learning have served him well in science experiments, social studies discussions, and throughout the program.

FINAL EVALUATION

Child's Name P Curriculum Area Social Skills

Skills child has demonstrated in this curriculum area (including social, physical, and cognitive skills as they relate to activities in this area):

Very cheerful and affectionate to other children.
Shares materials well.
Can verbalize his needs.
Able to defend his rights and property verbally.
Enjoys conversations with others.
Confident and proud of his skills.
Adjusts easily to new situations (a pleasure to take on a walk).
Very reinforcing in a friendship.
Plays cooperatively in a large group.
Initiates his own play and incorporates other children into it.
Independent in his activities; always busy.
In group times, patient when he knows when his turn to talk will be.
Responsible for self-help (e.g., washing hands, hanging up coat).
Initiates involvement into others' activities.

Skills in this curriculum area which the child should work on developing next:

Continue to develop skill taking turns in group discussions.
Develop listening skills while others are talking.

FINAL EVALUATION

Child's Name P Curriculum Area Physical Skills

Skills child has demonstrated in this curriculum area (including social, physical, and cognitive skills as they relate to activities in this area):

Large Motor Skills:

Very active outside; uses most of the equipment--slides, climbs, rides trikes, walks on planks, sets up material to use such as buildings with others.

Well-coordinated and strong: runs and jumps. (Enjoys jumping games where he stands at bottom of the slide and jumps out of the way when another child slides down.)

Slides down the fire pole.

Very aware of safety precautions.

Small Motor Skills:

Excellent fine motor skills.

Good eye-hand coordination--uses puzzles, stacking blocks, intricate block constructions, controlled skills with pens, crayons, brushes, glue, tape, carpentry tools, needle and thread, and placement of stickers.

Skills in this curriculum area which the child should work on developing next:

FINAL EVALUATION

Child's Name P Curriculum Area Art

Skills child has demonstrated in this curriculum area (including social, physical, and cognitive skills as they relate to activities in this area):

Unusual spatial visualization skills; can draw a three-dimensional perspective in two-dimensional form.

Complete in detail (paintings and drawings).

Interested in color arrangement.

Skillful in design.

Excellent attending skills.

Very verbal; able to describe experiences in detail.

Has lots of information.

Planning skills very good.

Extended length of concentration when working on projects.

Understands and uses color concepts: primary/secondary relationship; value concepts.

Skilled use of line, shapes.

Skilled use of manipulative materials.

Use of space and designing very good.

Interested in all work.

Self-directed.

Original ideas and creative use of materials.

Independent planner.

Shares well; works cooperatively with other children.

Can describe in detail works that he has done.

Very imaginative. Enjoys art.

Skills in this curriculum area which the child should work on developing next:

Continue development of art skills, particularly more three-dimensional work.

FINAL EVALUATION

Child's Name P Curriculum Area Drama-Movement

Skills child has demonstrated in this curriculum area (including social, physical, and cognitive skills as they relate to activities in this area):

Cognitive:

Imagination: good images offered of characters and environment when he participates.

Speaking: offers much information during pre-story and some limited dialogues when cued.

Intellect: follows story sequence easily; can solve problems well.

Concentration: excellent.

Social:

Emotion: beginning to interact with others in group.

Can express characterization through body and voice.

Cooperative and pleasant with others.

Physical:

Functional: good physical skills--runs, jumps, skips, hops, does combinations.

Expressive: beginning to show characterization and movement relating to action in story (wind, etc.).

Skills in this curriculum area which the child should work on developing next:

Work on offering new ideas in developing stories. (Can develop before story, but not spontaneously as you move through.)

Work on practicing leader roles.

Become more comfortable about expressing himself in imaginative situations, both verbally and nonverbally. Use of props helpful!

Physical skills like running, dancing, etc. could be worked on to get him used to moving freely!

FINAL EVALUATION

Child's Name P Curriculum Area Reading/Language Arts

Skills child has demonstrated in this curriculum area (including social, physical, and cognitive skills as they relate to activities in this area):

Able to identify all uppercase and lowercase letters.

Able to match uppercase/lowercase letters, except P-p and G-g.

Knows some of the beginning consonant sounds.

Able to write almost all of the uppercase and lowercase letters.

Able to copy words using same form (for example, copies in lowercase letters).

Enjoys giving key words and often rewrites word himself; seems to take pride in "reading" his word.

Able to attend to tasks and complete them, especially where writing is involved.

Expresses himself in fluent English. Good vocabulary and complete sentences.

Skills in this curriculum area which the child should work on developing next:

Continue work with identifying beginning consonant sounds.

Needs work writing lowercase letters. Has difficulty writing lowercase "n" and "g".

FINAL EVALUATION

Child's Name P Curriculum Area Math

Skills child has demonstrated in this curriculum area (including social, physical, and cognitive skills as they relate to activities in this area):

Counts at least to 25 sequentially. Counts objects to 8 before beginning to lose track. Recognizes numerals to 20.

Creates beautifully symmetrical designs in block arrangements or drawings.

Extremely good spatial ability. Draws with perspective. (Can draw a three-dimensional staircase; draws objects smaller that are farther away.)

Good at map-reading, spatial orientation.

Can reproduce a complex pattern of 8 attribute blocks perfectly.

Guisenaire rods: can verbalize relationships among length of rods; builds staircases.

Does simple addition and subtraction accurately, using counters.

Geometric shapes: can find different combinations of blocks to fill in a given pattern.

Sets, logic and attributes: grasps concepts of set, empty set, subset. Can compare numbers of objects in sets accurately. Categorizes accurately by attributes. Grasps unspoken criteria for sets. Can identify which block is missing from a set and can name its attributes. Grasps and verbalizes a one-difference relationship.

Works well with a partner. Long attention to solving a problem. Accurate and neat.

Skills in this curriculum area which the child should work on developing next:

Continue work with:

Writing numerals.
Keeping track when counting above 8.
Recording system for cuisenaire rod problems; continue with rods.
Intersection of sets; more work with logic.
Tangrams (too difficult for him now).
Graphs.
Measurement.
Geoblocks--more advanced spatial work.
Cuisenaire rods

FINAL EVALUATION

Child's Name P Curriculum Area Science

Skills child has demonstrated in this curriculum area (including social, physical, and cognitive skills as they relate to activities in this area):

Gives good descriptions of how things look, feel, smell, taste. Excellent sensory perception.

Enthusiastic about experimenting and using scientific procedure.

Has a fine sense for color.

Very observant; notices minute details.

Very interested in books about space, rockets; can understand scientific terms used in these books.

Excellent reasoning skills; can solve problems logically.

Skills in this curriculum area which the child should work on developing next:

Continue to provide work in independent experimentation.

FINAL EVALUATION

Child's Name P Curriculum Area Social Studies

Skills child has demonstrated in this curriculum area (including social, physical, and cognitive skills as they relate to activities in this area):

Excellent fine motor skills in cutting, pasting, writing, drawing.

Tremendous store of information about geography, ecology, families, animals, Indians.

Knows where Seattle is on United States map.

Knows geographical structures and map symbols.

His use of Indian symbols to make a full story was fantastic. He could draw all the symbols, knew what they meant, and how to arrange them to make a logical story.

Tells other children his needs.

Drew a fantastic mural of a polluted city with a fine building coated over with smog, and cars emitting smog. Understands a lot about pollution.

Uses phone and writes his phone number.

Skills in this curriculum area which the child should work on developing next:

More work with symbols, other languages, musical notation. P is ripe for more work in dealing with maps, abstract thinking and skills development.